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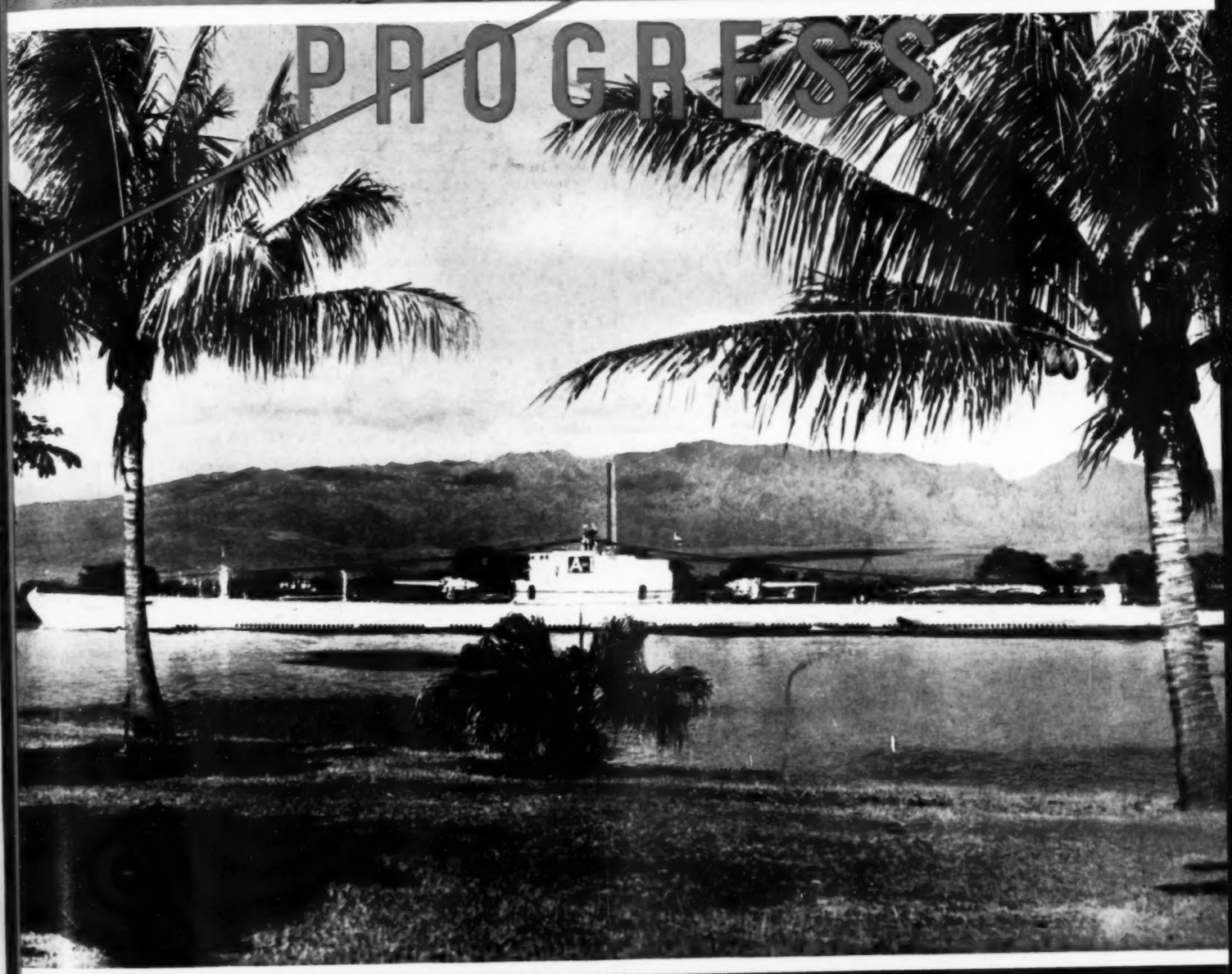
DIESEL PROGRESS



APRIL, 1943

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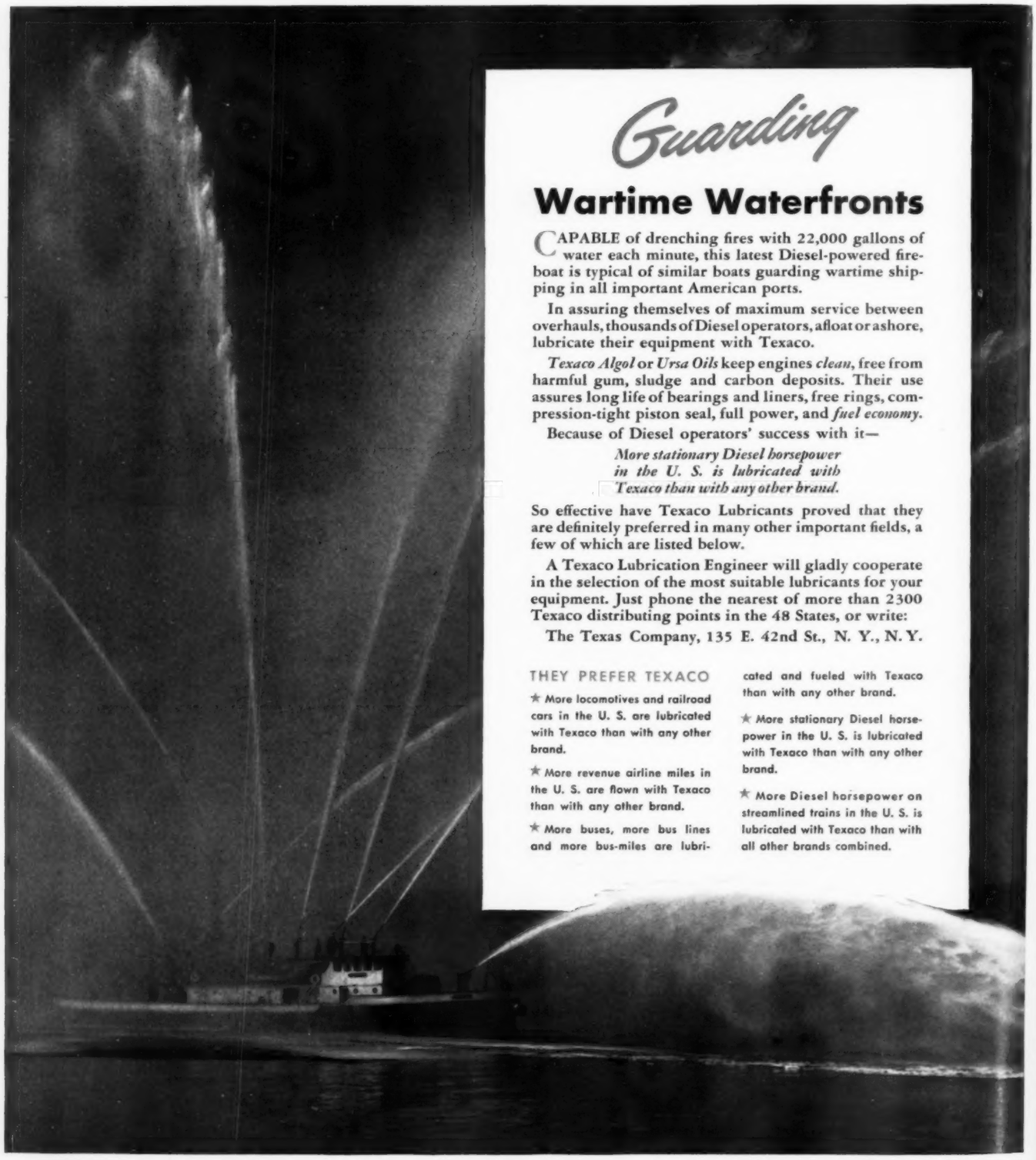

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FOR ALL DIESEL ENGINES

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DIESEL PROGRESS, for April, 1943. Volume IX, Number 4. DIESEL PROGRESS is published monthly by Diesel Engines, Inc., 2 West Forty-fifth Street, New York, N. Y. Rex W. Wadman, President. Acceptance under the Act of June 5, 1934, at East Stroudsburg, Pa., authorized March 27, 1940. Subscription rates: $5.00 per year, single copy, 50c.

DIESEL and GAS ENGINE PROGRESS

REX W. WADMAN
Editor and Publisher

WILBUR W. YOUNG
Managing Editor

FRONT COVER ILLUSTRATION: Official Navy photograph.

TABLE OF CONTENTS ILLUSTRATION: New weapon in the anti-sub war. The first glimpse the Navy has permitted of its new Destroyer Escort Vessel, designed to meet the marauding U-Boat on its own terms. Powered by General Motors Diesels, it is smaller than a destroyer but fast and powerful, and is being constructed in numbers to protect ocean convoys.

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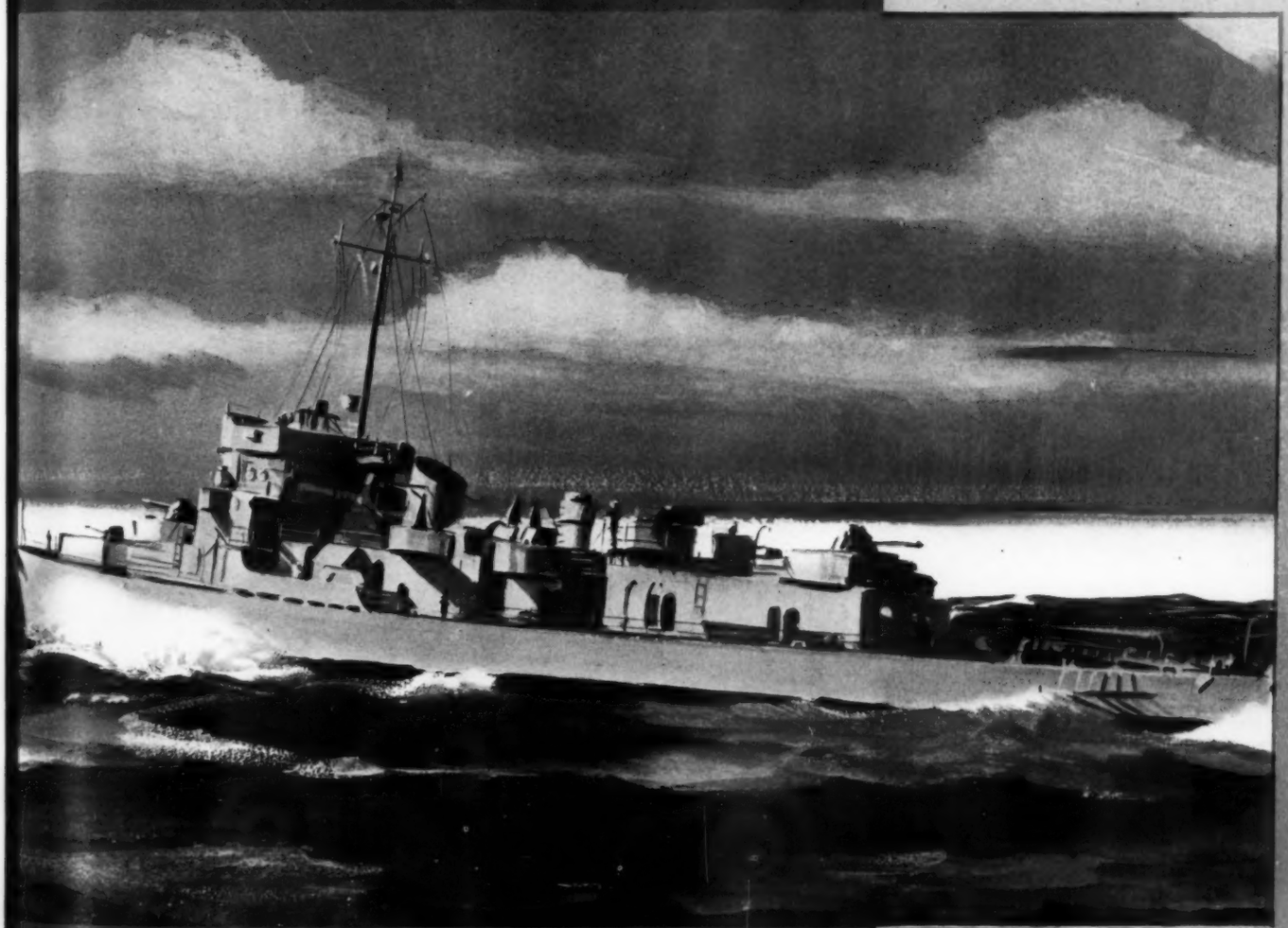
HEYWORTH CAMPBELL
Art Director



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HERE IT COMES

Five Caterpillar Diesel tractors hauling one plow—but what a plow—turning up 8 ft. of black loam to bury sand deposited by an unruly river.

THERE IT GOES

The drum is only six feet in diameter—the whole machine weighs only 15000 pounds.

This is Junie

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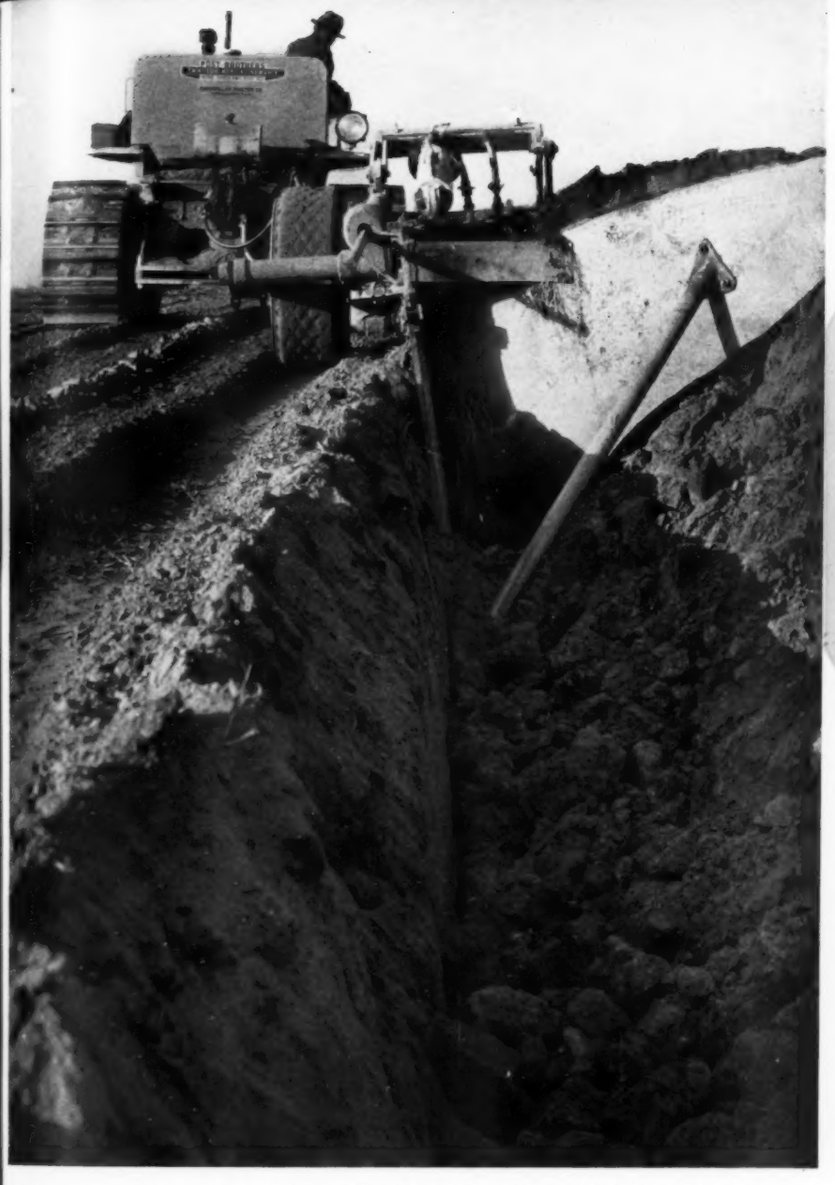


A TALL ONE FROM CALIFORNIA

By JIM MEDFORD

This is Junior—plows only 6 ft. deep with only one Caterpillar Diesel tractor hauling.

THIS might be the postwar conception of the Ukraine country of Russia because the furrows are deep enough to bury the aftermath debris of a battlefield. But as you may have guessed, it isn't. It's right here in Uncle Sam's country; in Orange county, California, to be exact in these days of censured news.

In this way it came about: The Santa Ana river, one of the Golden State's upside-down streams so named because eleven months of the year it runs beneath the surface, comes to the surface like the February groundhog the twelfth month and rushes away toward the Pacific Ocean with the same type of judgment used by a fat man trying to take an open umbrella through a revolving door. On its way it scoops up millions of tons of loose sand from the dry river bed and co-natural to the homeward bound inebriate it spills its load enroute. The result—sand all over the inundated fertile lower-bottom lands — several feet of sand.

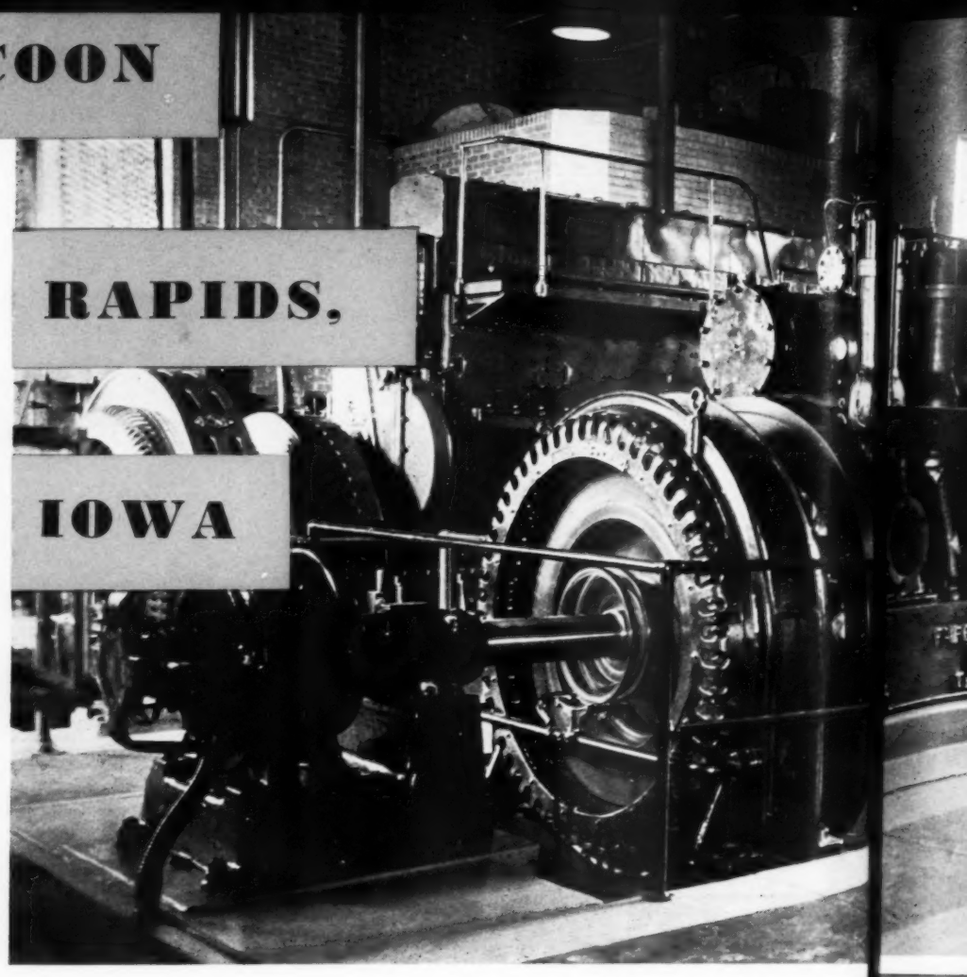
Such goings on irked the good farmers in the affected area and they got themselves a plow maker in the persons of the Post Brothers at Bolsa, near the county seat of Santa Ana. And these Post boys built a *plow*, the biggest danged behemoth that ever bucked the combined effort of five Caterpillar Diesel tractors to keep its point six feet below the sanded surface.

To see this monster all-up out of the ground, the expression of the granger at the county fair comes to mind—there ain't no such animal. Its 15,000 pounds makes it fitten to tie on behind Paul Bunyon's legendary blue ox Babe, the one Paul used to level the mountains into Kansas prairies. And to see it in action, well you wonder what that guy down the road put in your apple cider.

It's eight feet to the 12-inch solid steel beam, and ten feet to the over-all top. It moves on monster hollow drum six-foot wheels to get it over the soft ground without bogging its seven and a half tons. And to control the digging depth it mounts a hydraulic ram with controls led to the rear of the "wheel" tractor. And you gotta be fair-minded and believe the pictures—it takes five of Mr. Caterpillar's track-laying "mules," the big ones, three RD8's and two RD7's, to flop over four acres of soil per each eight hour day with this giant implement. And when the day is done, the river sand is in an upside-down position like its parent, the river. Good, rich, black loam lies steaming in the sun waiting for its next crop. The cost —just one American buck an hour, 25 gallons of four cent fuel . . . N. R. and C. R. Post, like their contemporary, Emily, lay down the rules for proper behavior. In their case, though, it's for California rivers.

COON RAPIDS, IOWA

By WM. H. GOTTLIEB



MOST power plant managers can sit back for a couple years after a new plant is completed and watch the load climb toward generating capacity, but the cement was hardly dry at the Coon Rapids, Iowa, municipal Diesel plant before it became evident that major expansion was necessary. This unusual circumstance was caused by a sudden expansion of industrial activity in this community of 1,500 population which, in turn, was induced partly by the promise of low cost power. The end result is a 1350 hp. Diesel plant producing two and a quarter million kilowatt hours a year for a thriving town at a cost of just 7.57 mills per kilowatt-hour.

The original plant, put into operation in June, 1937, had as prime movers two 2-cycle, mechanical-injection, crankcase-scavenging, Fairbanks-Morse Diesels; one 225 hp. unit direct-connected to a 148 kw., 2400 volt F-M alternator and one 375 hp. engine direct-connected to a 250 kw. F-M alternator. Production for the first year was about 600,000 kwh. and then the load went mountain climbing. The corn mill which is the town's largest industrial establishment decided to double its size and production if the municipal plant would supply the power.

And so the new power plant rushed plans for expansion. In September, 1938, just fifteen months after the first engines went to work, a new 750 hp., 4 cycle, mechanical injection Worthington Diesel, with a direct-connected 500 kw. Electric Machinery generator, was put on the line. The 600 hp. plant of the first year became a 1,350 hp. plant the second year. Production climbed steeply to an all-time high of 2,253,900 kwh. for the year ending March 31, 1942, the fifth year of operation.

The corn mill was not alone in encouraging this vast expansion. Improved rates encouraged other industrial activity; the commercial load increased; the Guthrie County R.E.A. dependent on this plant for power, pushed out new lines until now it serves 750 customers over 400 miles of line; and the local residential consumer, backbone of every small town power plant, was induced by favorable rates to boost his consumption. Here is the story of power distribution and rates paid for 1941-42:

Type of consumer	Kwh. Consumed	Aver. Cost per Kwh.
Residential	337,679	.046
Commercial	286,697	.038
Power	471,627	.021
Water Heating	150,757	.009
Street Lighting	57,600	.012
Water Pumping	60,734	.026
R.E.A. Co-operative	525,600	.011
Plant Use	138,470	...
Donated	10,109	...

And, what is more, the Coon Rapids plant shows a profit. Until the full cost of the generating and distribution systems is paid off, the profit is being expended for amortization of bonds, but the future holds promise of lower rates, lower taxes, and more free services.

All this is possible because the Diesel plant can produce power at low cost. To be specific, the operating costs of the plant for the 1941-42 fiscal year were as follows:

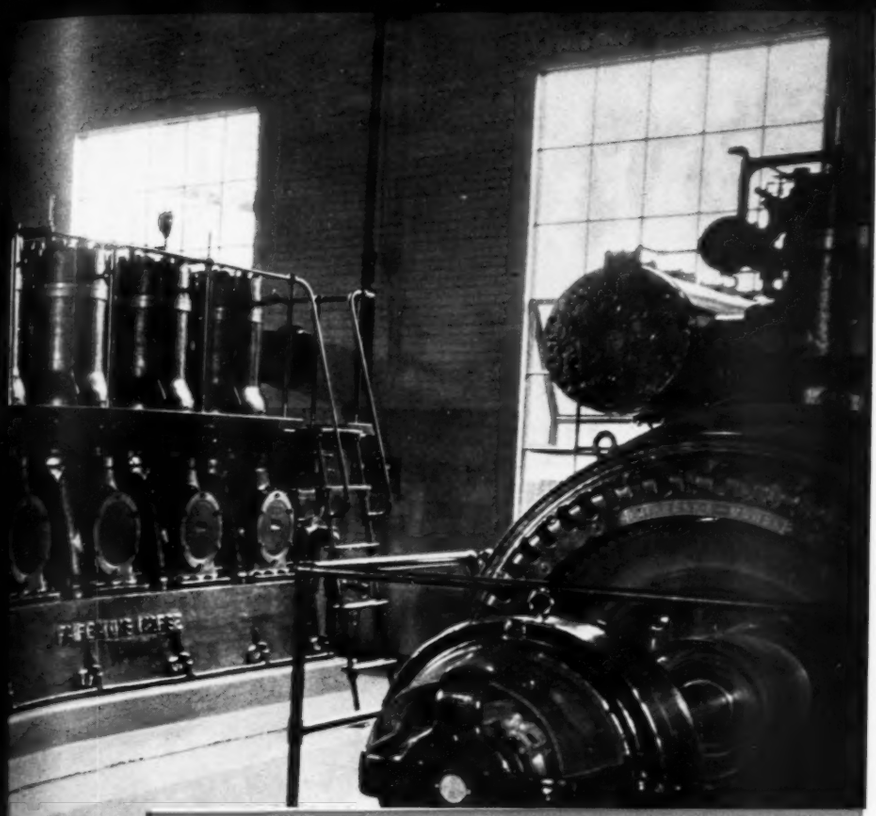
Labor	$3,722.85
Fuel Oil	10,991.96
Lubricating Oil	1,090.66
Engine Repair	200.00
Plant Upkeep	878.51
Insurance	150.00
Miscellaneous	21.86
Total Operating Cost	$17,055.84

With 2,253,900 kwh. produced, this represents a cost of 7.57 mills per kwh. Including interest and depreciation, the total is $26,855.84 or 11.9 mills per kwh.

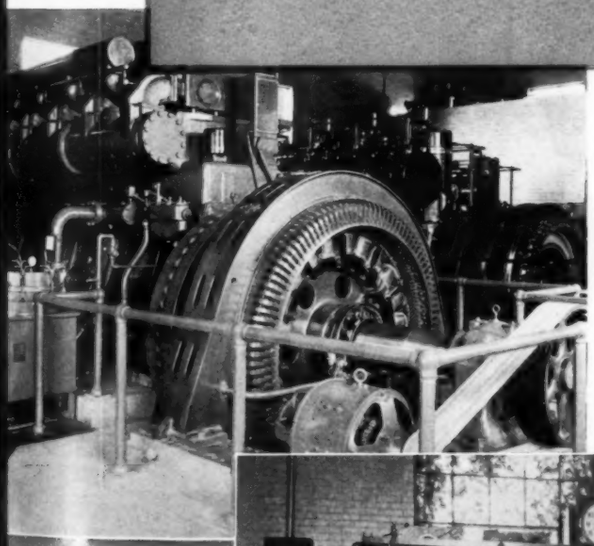
When over-all costs are low, we inevitably find a record of engine efficiency. At Coon Rapids, with an average operating engine capacity load factor of 63 percent, the return for fuel was 12.73 kwh. per gallon consumed.

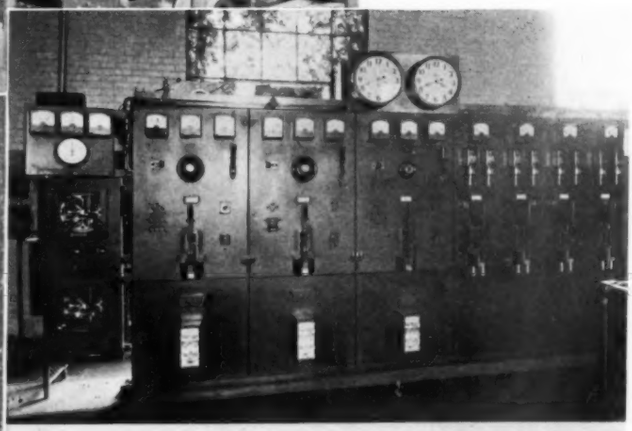
For fuel the plant has used a South Texas crude oil of 24 to 28 gravity, supplied by the Diesel Service Co. and delivered in tank car lots. Fuel can be unloaded from either railroad cars or trucks by a Fairbanks-Morse motor-driven rotary pump into two 12,000 gal. storage tanks, one vertical and one horizontal, above ground near the power house.

Three radiators give the plant a flexible closed cooling water system which requires less than twenty gallons of makeup a day even in peak periods. All the radiators are hooked together and any one or combination can be used on any one or combination of engines. Louvers are arranged so that the fans can draw air from either inside or outside the building and discharge the heated air inside or outside, thus heating the plant in winter and cooling it in the summer months.



Doubles Diesel Plant As Load Increases 400% In Five Years





Above: General view showing the Fairbanks Morse and Worthington Diesels at Coon Rapids. Left: Close up of the new 750 hp. Worthington Diesel. Below: Views of switchboard and exterior of the plant.

The plant has had considerable success with lubrication, for the record shows five years without a stuck ring and extremely small wear.

Maximum liner wear on the smaller engines was .005 in. in 30,000 hours of service. After 7,000 hours, the big engine shows no measurable wear. Sinclair Rubilene is used to lubricate both bearings and cylinders. The Worthington Diesel has a triplex Cuno filter and a Schutte & Koerting cooler in its bearing lubricating circuit, while a Hilco purifier operates continuously taking lube from the crankcase, cleaning it and returning it to the crankcase. Oil picked up by the wiper rings in the F-M Diesels drains to a used-oil tank and is put through a Renuoil purifier in batches and returned to the engine supply tanks. Cylinders are supplied with lube by force-feed lubricators, Manzel on the Worthington, and Madison-Kipp on the Fairbanks-Morse. Each of the three Diesels has a Woodward Governor.

Air for all units passes through filters outside the plant and, in the case of the big engine, through a Maxim intake silencer. Each engine is equipped with a vertical Maxim exhaust silencer outside the building. Starting air for all the engines is supplied by a pair of Fairbanks-Morse compressors, one driven by electric motor and one by a gasoline engine. There are two Alnor multi-point exhaust pyrometers, an 8-point instrument serving both F-M Diesels and a 6-point for the Worthington. An alarm system has been provided to warn the operator of a drop in water temperature or lube pressure. The 8-panel General Electric switchboard holds two Allis-Chalmers voltage regulators and G-E recording polyphase fifteen-minute interval demand meter, totalizing kwh. meters, time over current relays and other instruments.

The plant is operated under the direction of Superintendent M. R. Wait with a staff of three operators and one utility man who also serves the distribution department. All maintenance work is done by the normal plant staff which is well supplied with equipment such as strain gauges, inside micrometers, dial micrometers, and a Bacharach indicator. The power system is managed by a Board of Trustees appointed by Mayor Dave Davis for 6 year terms with the approval of the City Council. Present membership of the board is C. H. Whitten, chairman, O. A. Kretzinger and J. E. Howe.

Power plant operation at Coon Rapids is a game of double and redouble: the plant doubles, the load doubles and doubles again, while rate reduction and profit keep pace.

NEW TRIPLE-SCREW TOWBOAT, "SOHIOAN"

By WILL H. FULLERTON

THE *Sohioan,* most powerful Diesel towboat on the river, was designed and built for The Standard Oil Company of Ohio by the St. Louis Shipbuilding and Steel Company. It went into service February 15. This gives the shipbuilding company another "first," it having previously built the largest all-welded hull for inland rivers, the largest all-welded derrick boat and many other outstanding pieces of floating equipment.

The *Sohioan* is powered by three Fairbanks, Morse Diesel engines, each developing 805 hp. at 300 rpm. There are a few other triple screw towboats on the river, but none which even approximate the horsepower of the *Sohioan.* Due to a limitation on the draft, it had been thought impractical to use much more than 800 hp. on a shaft, and this has kept the maximum horsepower on most propeller towboats to about 1600 hp., although a few have been built somewhat larger.

When The Standard Oil Company of Ohio decided to add another towboat to its fleet, it wanted to obtain the greatest amount of power in a single hull that experience and research indicated would be practical. The design embodied the best features dictated by both experience and research and carried the art still further. The result is the *Sohioan.*

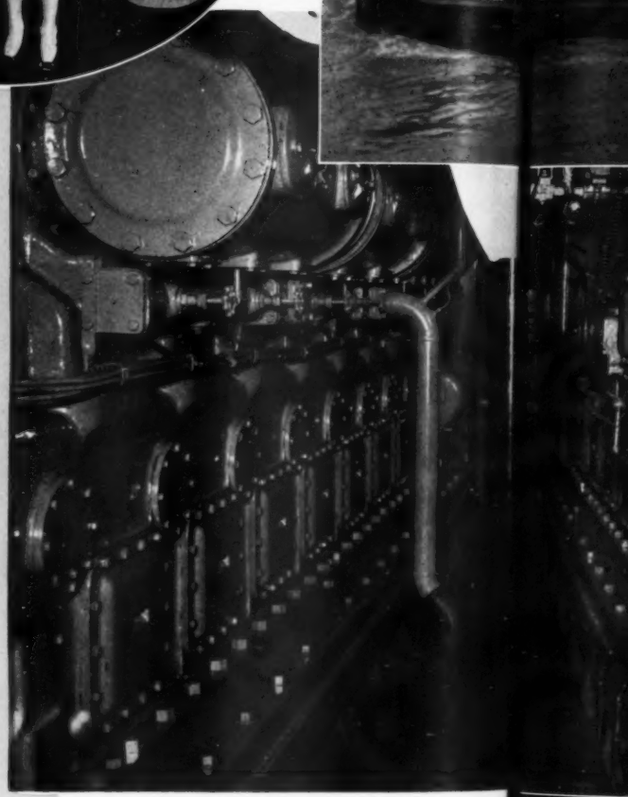
Before starting construction, Sohio had tank tests made by Dr. K. M. S. Davidson on a 10-foot model in the test tank at the Stevens Institute of Technology in Brooklyn, N. Y. These tests proved the efficiency of the design of the new towboat. In keeping with the modern ideas on horsepower and hull design, the builder has made the *Sohioan* the first streamlined towboat on the rivers, and the long easy lines of the *Sohioan* typify the complete modern design of this towboat.

The hull of the *Sohioan* is 160 ft. long, 38 ft. beam, and 10 ft. deep, and the draft is 6 ft. 6 in. The bow is the model-scow type, and the stern is of the same special design used by the St. Louis Shipbuilding & Steel Company on many of their other boats. The engine room is located near the stern of the boat, thus using a short propeller shaft and putting all the quarters ahead of the engine room, which eliminates engine noises from the quarters. This type of design has been used by the St. Louis Shipbuilding & Steel Co. on their last two boats, the *Glenn Traer* and the *Celeste,* and has proven very satisfactory. The St. Louis Ship. standard cooling system has been built into the hull to cool the main engines; however, a Bell & Gosset exchanger has been connected to the center engine to be used in the hot summer months only.

The *Sohioan* is powered by three 7-cylinder Fairbanks, Morse & Co. Diesels of 14 in. bore and 17 in. stroke, developing 805 hp. each at 300 rpm. All three engines are operated from a single control stand in the engine room so that they may be operated by one man. Each engine is of the Model 37 type embodying oil cooled pistons, back flow scavenging with built-in scavenging pumps, open-head combustion, differential injection nozzle, water cooled exhaust manifold, and pressure lubrication. Each engine is directly reversible, and each cylinder receives air for starting and reversing, thereby eliminating any "dead spots" in operation.

Another interesting feature of this boat is that it is planned to use crude oil for fuel, and for this reason a Sharples centrifuge has been installed. The *Sohioan* will be pushing crude oil, and the boat can take fuel direct from the barges through the centrifuge and into its own tanks. The boat has a fuel capacity of over 300 tons and carries a small

Christened as she went into service, the "Sohioan" was sponsored by Miss Margaret Holliday, center, daughter of W. T. Holliday, President, Standard Oil Co. of Ohio, left. H. T. Pott, President, St. Louis Shipbuilding and Steel Co., right.

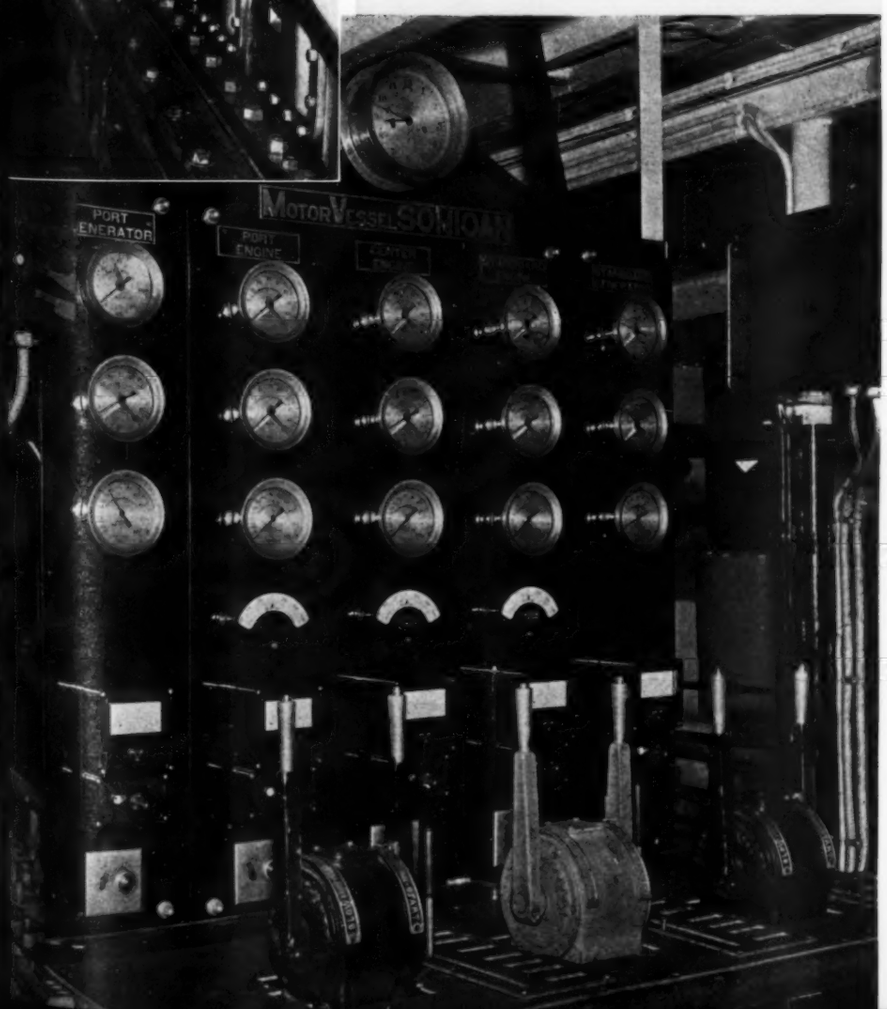


Lower engine room view showing two of the three 805 hp. Fairbanks-Morse main Diesels.

The streamlined 160 ft., 2415 hp. river towboat "Sohioan" on trial run.

Officers' lounge on the "Sohioan."

Engine room gauge board showing various oil, water, and air gauges, three Weston tachometers and five multipoint Alnor pyrometers.



supply of Diesel fuel oil for the range and heating boiler burners.

Electric power is furnished by two 90 hp. 450 rpm. Fairbanks, Morse & Co. engines each direct connected to a 60 kw. F-M direct current generator. The switchboard is of the dead front safety type, manufactured by Wurdack Electric Manufacturing Co.

The main engines are equipped with Maxim silencers and American Air filters on the air intake and Burgess marine snubbers on the exhaust. The engines on the generator sets have Maxim exhaust silencers. Lubricating oil and soft water is circulated through each engine before starting and after shutting down by three before-and-after pumping units. Each unit consists of a 7½ hp. F-M motor with a double extended shaft, one end connected to a F-M water pump and the other end connected to a rotary lubricating oil pump.

Each of the five engines is furnished with a built-in fuel oil transfer pump which pumps the oil from the main fuel bunkers to overhead fuel tanks, pumping through Nugent fuel oil strainers. The oil moves from the day storage tanks through another set of Nugent filters to the injection pump reservoirs.

An attractive gauge board is provided in the engine room, with lubricating oil and water pressure gauges, together with temperature gauges having high and low electrical contacts which sound an alarm in case of water or oil failure. Weston tachometers are furnished on the gauge board and also in the pilot house.

Pilot house control stand in which are compactly grouped the special engine room telegraph, steering levers, Weston tachometers, and light switches.

Alnor pyrometers are furnished for each engine. The lubricating oil coolers were furnished by Ross Heater and Manufacturing Co. and the lubricating oil strainers are of Schutte & Koerting make. A Youngstown-Miller lubricating oil purifier was installed on the boat.

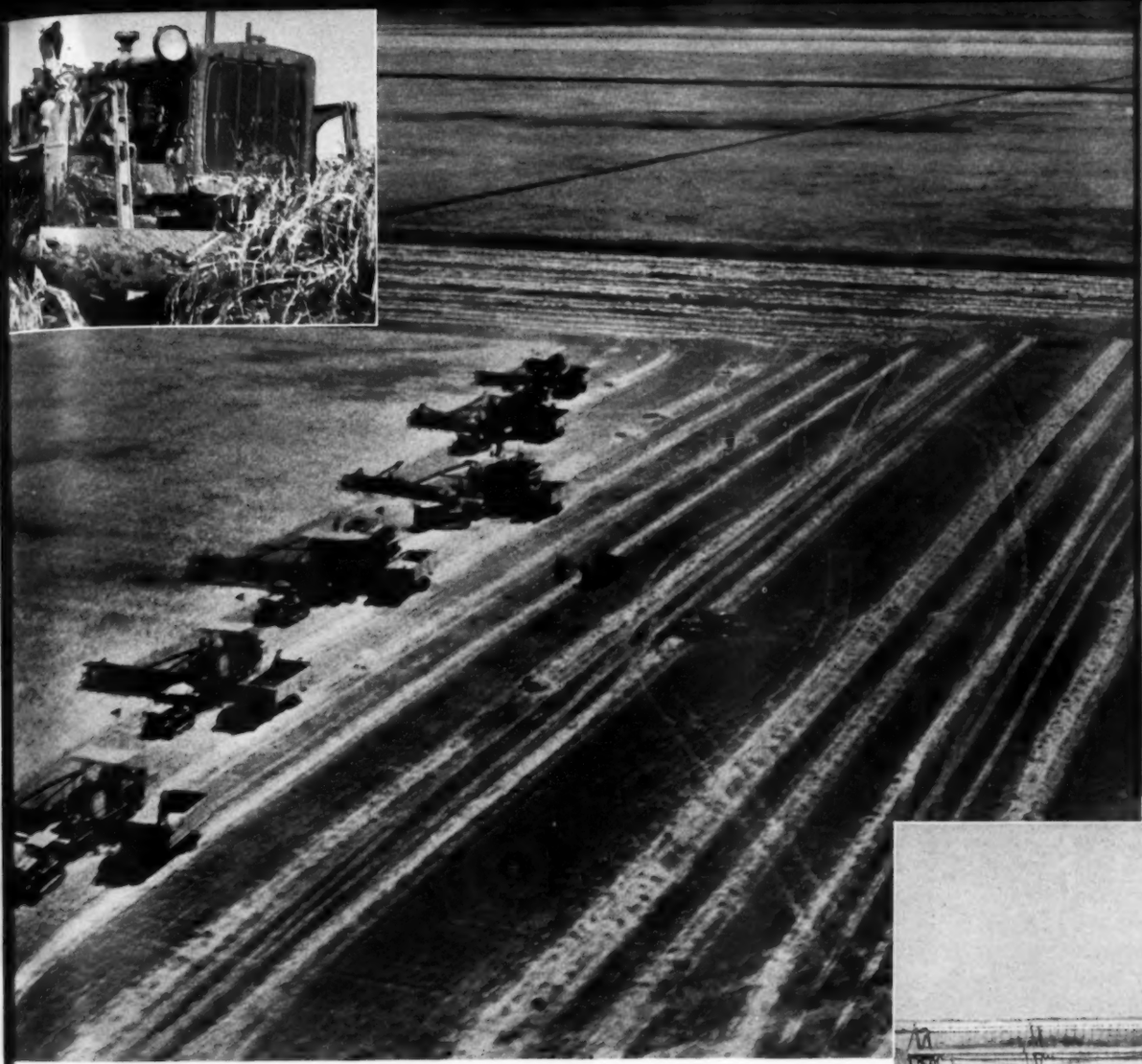
As the *Sohioan* is to be used for towing crude oil and its products, more attention is given to the fire fighting system than on the average towboat. In addition to the motor-driven Gardner-Denver fire pump, a gasoline engine driven auxiliary fire pump has been installed on the main deck aft of the deck-house, and a Foamite generator is connected in the main fire line header.

Engine starting air is supplied by two electric-driven Gardner-Denver two-stage water cooled air compressors. The air tanks were furnished by Morrison Bros. Co. Two Carter self-priming centrifugal pumps were installed for use on bilge and ballast system.

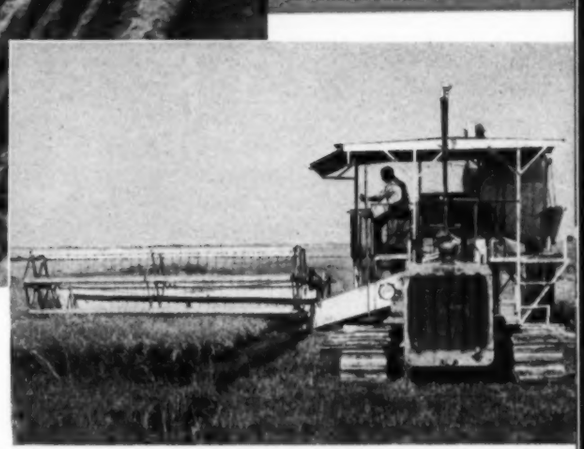
In accordance with Sohio's policy, especial attention was paid to the comfort of the crew. In the engine room, the ceiling has been sound proofed with fireproof acoustic panels and acoustic blanket, and the engine room walls are lined with fireproof Flexboard and insulated. All this material was furnished by Johns-Manville. The hull compartment forward of the engine room contains most of the pumps and air compressors, and in this room there are two fresh air ducts and two electric fans exhausting into the main engine room. In the ceiling of the engine room is installed a 5 hp. blower exhausting outside. The quarters of the *Sohioan* are air-conditioned. A Yorkaire Unit and a Crane heating boiler provide for a uniform temperature in the quarters whether the outside temperature is 0 or 100. The galley is completely equipped, and with its spacious cupboards, large South Bend range, 83 cubic foot Frederick Refrigerator, an 11 ft. Geo. Lytle Quick Freeze Box and an electric dishwasher, it is thoroughly modern.

The boat has accommodations for a crew of twenty-two men and has two spare rooms. Sohio's interior decorators and artists collaborated with the St. Louis Shipbuilding and Steel Company on the interior finish, color scheme, and furniture. The result is an unusually comfortable and striking layout which at the same time is simple and unostentatious. The quarters are floored with Armstrong Linotile. The boat has pressure systems for drinking water, wash water, and sanitary water, and a still has been installed to supply drinking water. Cooled drinking water is available on both decks. Berthlights are installed at each berth, and a telephone system has been installed for communication throughout the boat.

The steering system is of the St. Louis Shipbuilding and Steel Company standard electro-hydraulic type with an electric follow-up system. The position of the steering levers in the pilot house indicates the position of the rudders. The three steering rudders and the six backing rudders are controlled separately. In the pilot house, the central feature is the pilot house stand. The builder has designed a special stand to take care of the control of the main engines, engine room telegraph, steering levers, tachometers, air gauges, and light switches for the navigation lights, guard lights, etc. A special electric type of engine room telegraph was installed to enable the engineer in the engine room to have a neat control stand similar to that in the pilot house. The boat has two 19 in. Carlisle Finch searchlights and a Kahlenberg triplex air horn. Instead of the usual whistle light, the *Sohioan* has a 24 in. letter "S" that shows ahead when the whistle is sounded.



Upper left: Diesel tractor with attachment designed for knocking down rice checks. First pass knocks down vegetation three to six feet high, second pass levels off check. Left: Eagles' eye view of Elmer Von Glahn's fleet of Caterpillar Diesel tractors pulling 25 ft. cut combines. Below: Tom Sill's farm shop built combine rice harvester pulled by a Caterpillar tractor.



DIESELIZED RICE PRODUCTION BEATS JAPS AT THEIR OWN GAME

By F. HAL HIGGINS

CALIFORNIA harvested an all-time record rice crop in 1942 and is preparing to increase its acreage for 1943. The mere cold figures, however, don't tell the economic revolution wrought between World Wars I and II. For it was war that really started California farmers to growing rice on a big scale with machines that are now fairly completely Diesel-ized as far as the heavy work of levee building and harvest are concerned.

Back in 1912 commercial rice growing was started on the Coast with 1400 acres. By 1920, acreage went up to 162,000. Last year the record acreage was 207,000, or 45,000 more than in any previous year. This acreage yielded 5,298,254 bags, which was nearly 1,000,000 bags above the previous record crop of 1940. The annual crop averaged around 127,000 acres in that pre-Diesel tractor era right after World War I.

"But California can't grow rice other than as a War Crop," declared the economists and supposedly smart folks at the time the farmers took up the crop in a big way and began to mechanize it as they had done with all other big California crops they profited at growing by multiplying one man's output by cutting costs. They did such a good job as they swung from the old ways of thresher and horses to tractor and combine that they not only grew rice after World War I, but on occasion shipped their rice to the Orient in competition with coolie-produced rice that was supposed to be grown so cheaply nothing could compete with it. By 1936, Prof. Jones of the University of California admitted that these California machine-minded farmers had upset the old fundamental that it couldn't be done: raise rice cheap enough to compete with the Japs who grew it for 1 cent a pound and hauled it over to this country for 1 more cent for a total cost of production and transportation to the world market of 2 cents a pound. We did two things, said Prof. Jones: developed better varieties, and did the job with machines on a big scale. And those machines meant Diesel tractors as shown in the illustrations. They have made the biggest cuts in costs.

COMPRESSOR STATION ERECTED IN 80 DAYS INCREASES PIPELINE CAPACITY THIRTY PERCENT

To Meet Wartime Demand for Steel, Pittsburgh Mills Required Increased Gas Shipments from West Virginia–Equipment and Erection of 1800 hp. Compressor Station in Record Time Increased Line Capacity by 15 Million Cubic Feet Per Day

D. S. KEENAN

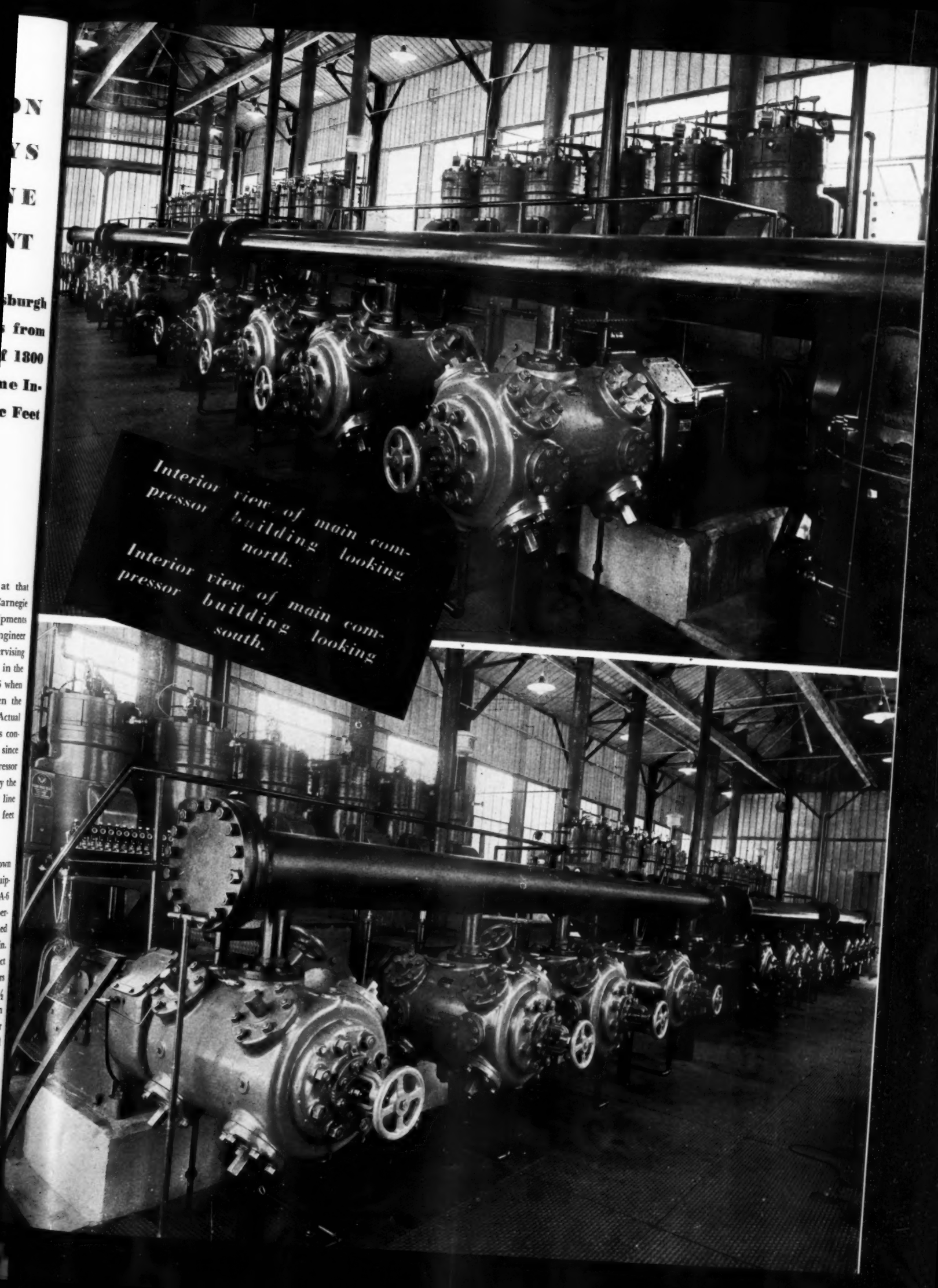
President, Carnegie Natural Gas Company

WAR in Europe, the requirements of Lease-Lend, and finally the entrance of the United States into the war stimulated the demand for steel in this country to unprecedented heights. In the Pittsburgh area, as elsewhere throughout the country, furnaces that had long been idle sprang into life, surplus capacity was strained to the utmost, and every facility that contributed to the production of all-important steel was overhauled and reappraised as to maximum capacity. By the summer of 1941 demand had far outrun producing capacity with no prospect of an early let-up in the pressure of demand. Among its other far reaching effects, the vastly increased tempo of operations threw a considerable strain on the transportation facilities of the natural gas industry of West Virginia which supplied fuel to the steel mills of Pennsylvania. As an example of the speed and efficiency with which this emergency was met and the flow of gas to the steel mills maintained at the increased rates required, the construction of a compressor station by United Fuel Gas Company on their line to the Carnegie-Illinois Steel Corporation's plant at Pittsburgh in record time as described in this article furnishes an outstanding illustration.

In September, 1941, the 16 in. main transmission line of the United Fuel Gas Company which transported gas from the West Virginia fields to the Carnegie-Illinois Steel Corporation's mills in Pittsburgh had a capacity of 51 million cubic feet of gas per day and was being operated at maximum capacity. It was foreseen at this time that additional fuel would be required by the mills to meet the growing demand for steel. In fact, 15 million cubic feet per day of additional gas would be needed before December 15, 1941. Consequently authorization was obtained by United Fuel Gas on September 16, 1941, for the construction of an 1800 hp. compressor station on the line two miles from Smithfield, West Virginia. On the very day the authorization was obtained orders were placed with Clark Brothers Company for three 600 hp. main compressing units and the site for the station was obtained approximately mid-way on the main transmission line. Excavation was started for construction of the compressor station three days later.

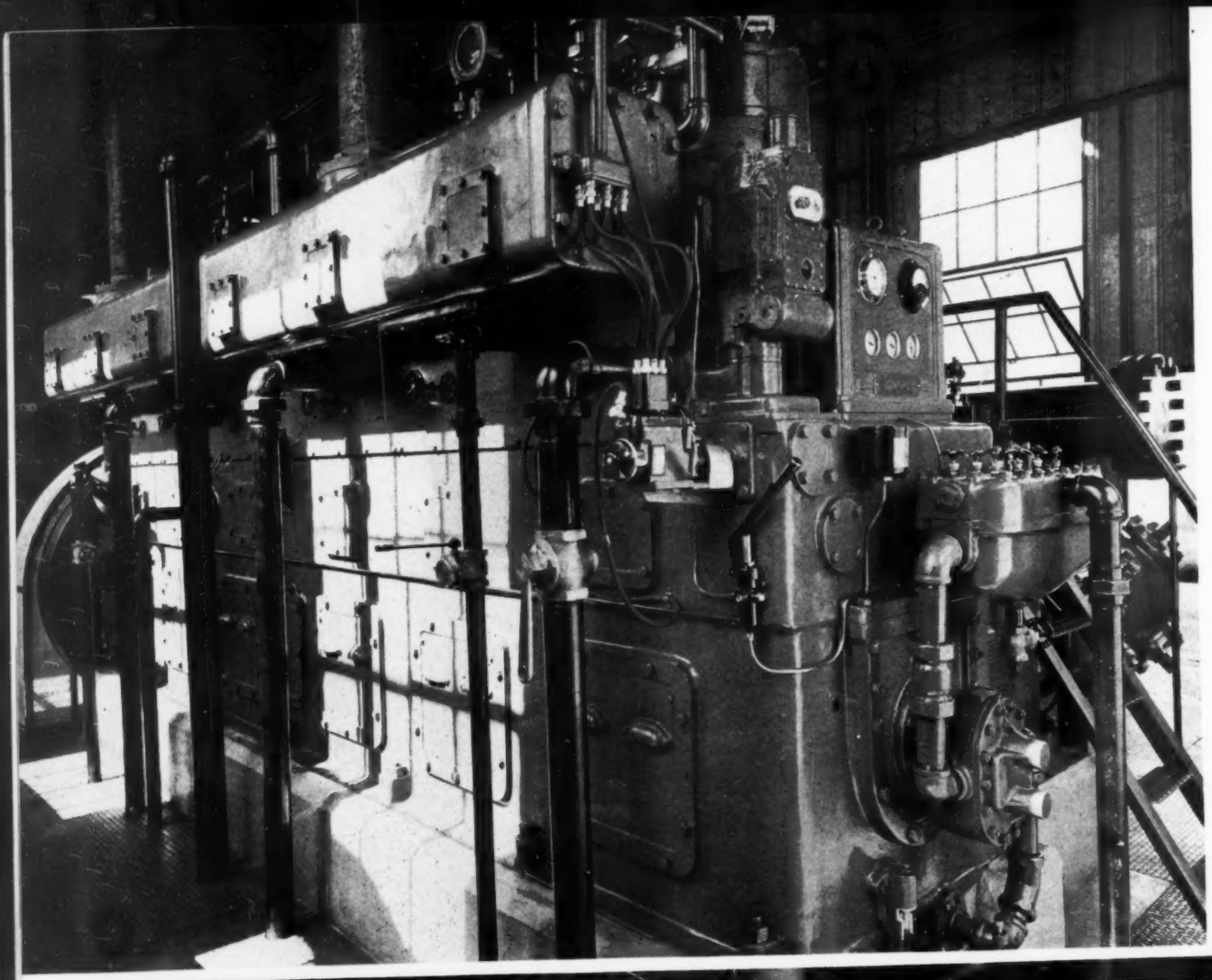
In view of the importance of the additional fuel to the steel industry and thus indirectly to the war effort, high priorities were obtained on all the materials required and the first of the three main compressors was delivered by Clark Brothers on November 14, the second on November 17 and the last on November 22, constituting a record in the construction of such heavy equipment, all the more remarkable because of the difficulties of obtaining anything like reasonable delivery of materials at that time. With D. S. Keenan, president of Carnegie Natural Gas Company, expediting shipments and delivery and H. M. Baker, chief engineer of the United Fuel Gas Company supervising all work on the project, it was completed in the record time of 80 days from September 16 when orders were placed to December 5 when the station was declared ready for operation. Actual operation started on December 7 and has continued at maximum capacity every day since that date. The operation of this compressor station increased the capacity of the line by the required 15 million cubic feet giving the line a maximum capacity of 66 million cubic feet per day delivered to the Pittsburgh mills.

Several detailed views of the station are shown in the accompanying illustrations. The equipment consists of three 600 bhp. Model RA-6 super two cycle, right angle gas engines operating at 300 rpm. These engines are furnished by Clark Brothers and each have six 14 in. bore by 14 in. stroke power cylinders direct connected to the double acting compressors which are four cylinder models having an 8½ in. bore by 14 in. stroke. Each of the main units is equipped with a lubricating oil filter and cooler, McCord lubricators, an overspeed stop and scavenging air by-pass control. In addition they have V-belt driven circulating



Interior view of main compressor building looking north.

Interior view of main compressor building looking south.



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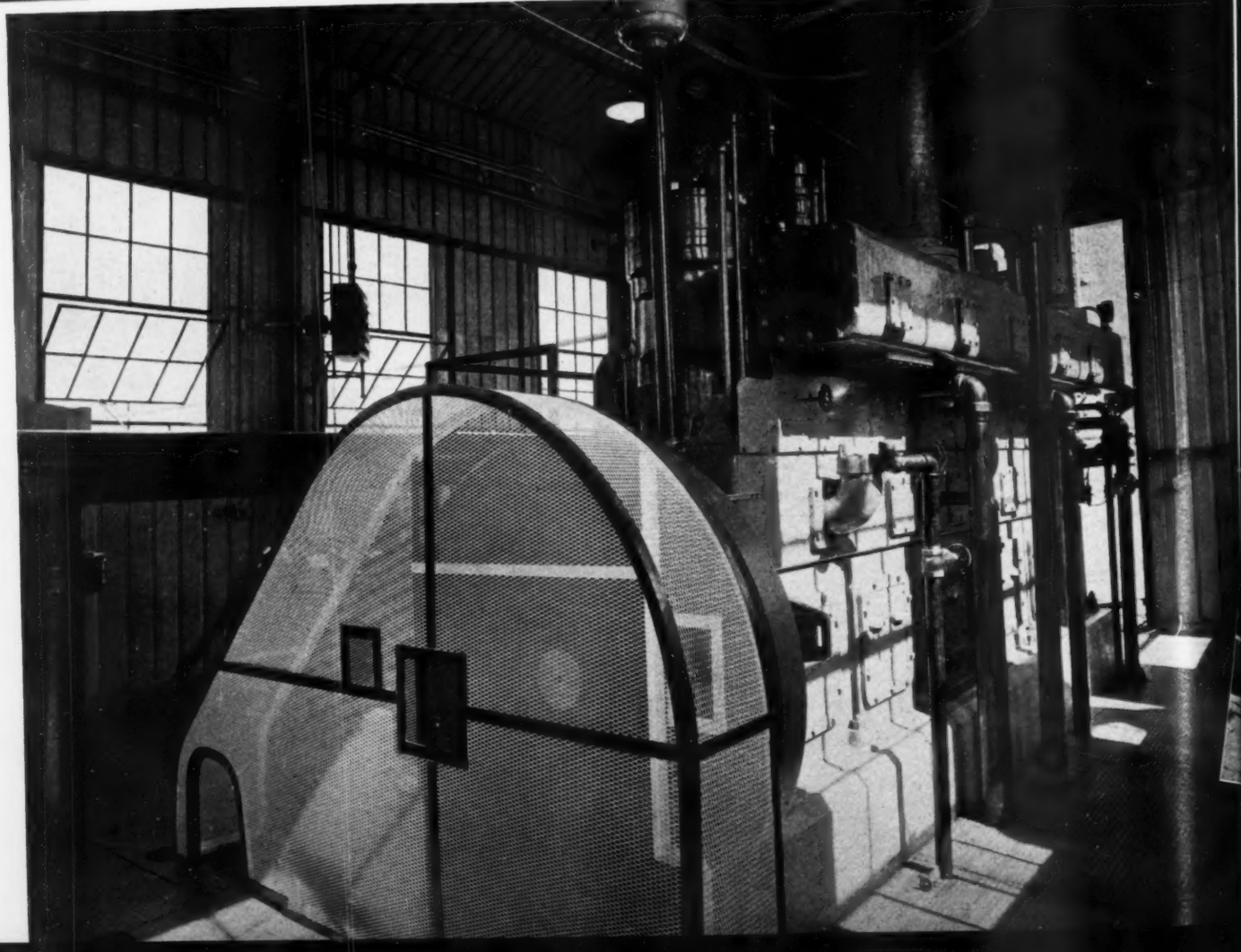

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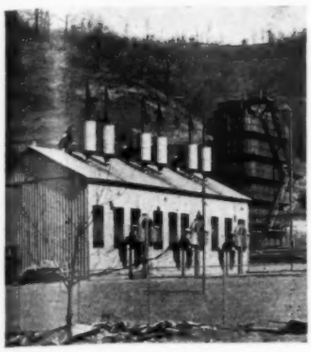


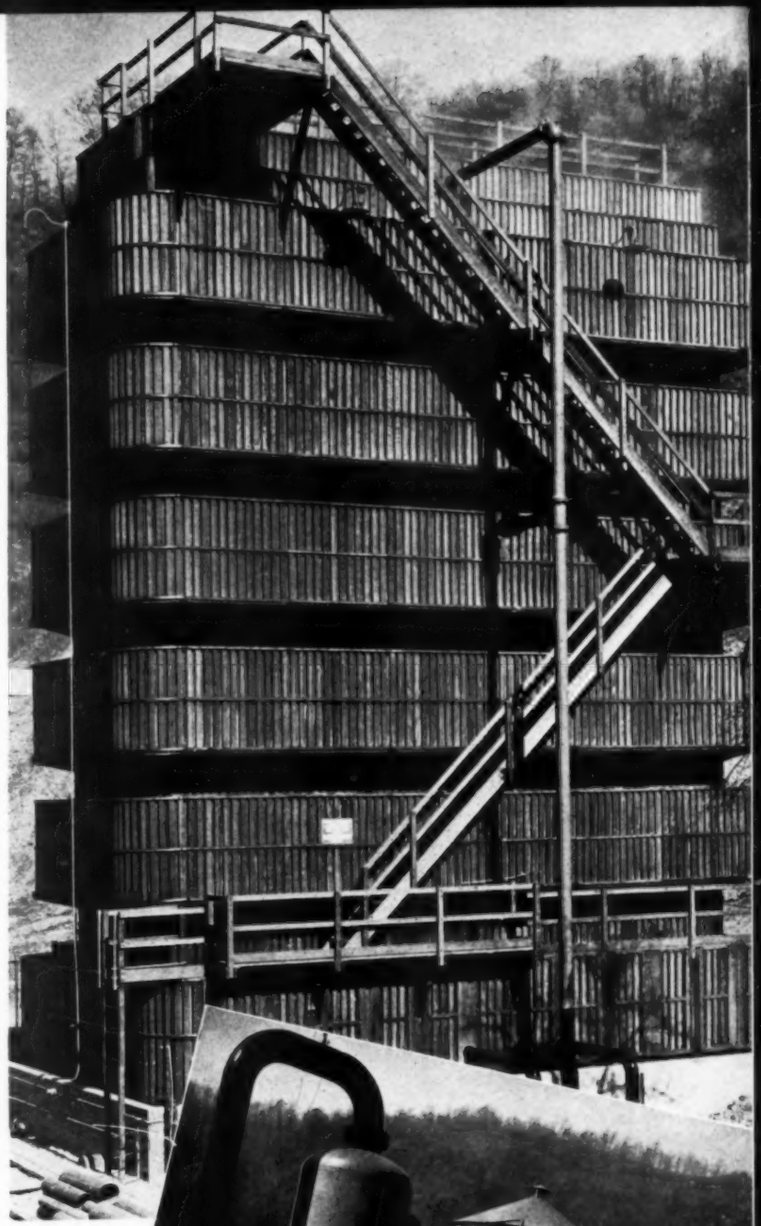
← *Exterior view of the engine house, a Butler steel building measuring 26 ft. x 78 ft.*

→ *View of the Fluor cooling tower. Engine jacket cooling system is open type.*

water pumps mounted on slide rails, exhaust mufflers and oil bath type engine intake air filters. These units are housed in a Butler steel building on concrete foundations measuring 26 ft. by 78 ft. by 18 ft.

In a second Butler steel building on concrete foundations two Cooper-Bessemer GSD two cylinder, 60 bhp., two cycle vertical gas engines operate at 550 rpm. These are connected by V-belt to two 40 kw. packaged alternators to operate in parallel with the duplicate unit. Other equipment in this building consists of a 20 hp. electric driven auxiliary water pump, an air starting compressor driven by a gas engine and a gas fired steam boiler for heating. Lockers and washrooms are located in this building.

Outside, as revealed in one of the accompanying illustrations, is a Fluor Model 6-XA-15 cooling tower mounted on a five foot concrete base; gas cooling equipment consists of four Griscom-Russell bentube sections located in the bottom of the cooling tower. An open type of water system is used; water is pumped from the engine jacket to the top of the cooling tower flowing downward by gravity over the tower and the bentube sections back to the water jackets. Make-up water from nearby Fishing Creek is sand-filtered and chemically treated before being pumped to the cooling tower basin. Gas entering the station is conditioned by a 60 in. Blaw-Knox scrubber. As a result of a ten-mile extension of the telephone lines during the job the station enjoys the convenience of a direct connection with the United Fuel Gas Company's Charleston office.



Below, left to right: Exposed type gas piping system; view of compressor side of 600 hp. Clark angle unit; Knox gas cleaner and oil settling tanks.

GUAYULE AND DIESELS RACING AGAINST PEACE AND TEST TUBE FOR TIRE JOB

By F. HAL HIGGINS

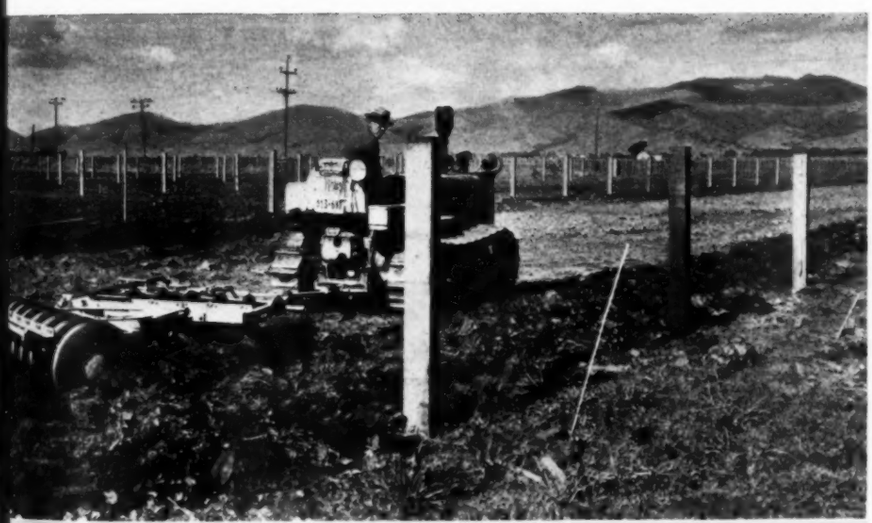
TAKE one eye off your right rear tire and cast it at the Guayule plantations being set out in five or six States in the semi-arid U. S., for something is going on there that means rubber from U. S. farm and waste lands before many months. And it's not slow motion you will see, regardless of what you are thinking and saying under your breath about the New Dealers and their synthetic rubber programs from Washington, for this Guayule program has been turned over to the U. S. Forest Service, and those boys know how to move and do things—NOW!

Your author has been watching this desert bush called Guayule and the efforts of U. S. industry to tame it to "give" rubber for the past fifteen years. In fact, he saw about 8,000 acres of it growing in the Salinas Valley of California when he came out to the West Coast in 1927. He saw rubber tires made from it that experts said would wear "pretty well," though they admitted that Guayule as a source of rubber would come into the economic picture only when war or some other emergency put the price of rubber up to 20 cents a pound. Well, here we are with a war in our laps and no tires on our cars!

Last year the Guayule project and its proved facts of the past twenty years got the ear of Congress long enough to get a $2,000,000 appropriation and a Go-Ahead signal. The average man on the street might pause to ask how it happened that somebody like the U. S. Forest Service got the job. The political way is to hand Government jobs to somebody who doesn't know anything about doing the job other than to get out a lot of questionnaires that call for the employment of a regiment of fresh young lawyers to interpret them. But somebody must have slipped this one past the boys up-town in Washington when they were busy on something else. Anyway, the public got the best organization in the world for the job and they are getting action that means rubber. It may mean another three years before any appreciable amount of rubber comes out, as the plantings are being spread over some 100,000 acres with all the seed being used from the 2,000 acres growing under the old cultivations when the new program broke on the scene.

The bill that brought the purchase of the Intercontinental Rubber Co. by the U. S. Government was introduced in June, 1941. Not till after Pearl Harbor gave 93% of the world's rubber supply to Japan did action come, however. The job was given to the United States

Diesel tractor-pulled six-row transplanter setting young Guayule shoots. This equipment will set twenty acres a day.



Top view: Shows two Caterpillar Diesel tractors pulling six-row Guayule transplanters. Above: Disking a nursery bed for seeding to Guayule. The U. S. Forest Service has shown real speed on this project near Salinas, California.

Preparing the soil for transplanting Guayule. The U. S. Forest Service has learned about Diesels in this fight against time.

Forest Service with headquarters at Salinas. Major Evan W. Kelley is regional forester for the northern Rocky Mountain district of the U. S. Major Kelley knew Diesel tractors from his work in high altitude building of roads. Hence, the use of Diesel tractors on quite a scale could be expected. But here the building of tracktype tractors for many fields outside war construction and Army and Navy service was so sharply curtailed that they have had to buy many gasoline tractors where Diesels would be much more economical. The pictures of actual operations, however, show that rapid progress with economy is being made with many Diesels—Caterpillar, International, Allis-Chalmers and Cletrac.

The actual work is largely big scale farm development such as the West has seen on every hand for more than half a century. Special machines for planting, transplanting, and harvesting had to be designed and built, of course, as Guayule is not quite like anything else. Lots of hand work that took nearly 1,000 men was involved: 500,000 stakes to be made and driven, 42,000 posts set, six deep wells dug for irrigation, sixteen miles of underground pipe, 460,000 feet of overhead piping for sprinkling system with holes drilled and nozzles screwed in every two feet, 110 miles of snow fence erected, etc. A lot of hand work to be done accurately and rapidly while the big Diesel tractors were plowing, leveling, disking and transplanting the plantations. Sand and sawdust were used in big lots for mixing with the seed, which had to be chemically treated to speed its sprouting. Otherwise the seed might lie around as long as eight years before germinating and sprouting.

A six-row transplanter pulled by a Diesel tractor will plant about twenty acres a day with a crew of nine men feeding the tiny plants into the plant setting mechanisms that set, water and tamp them with a gong ringing every second for accurate timing and spacing.

With plans to get 300 pounds of rubber per acre and close to 100,000 acres set by this spring, the foundation is laid for a real home-grown rubber program that should get some tires coming while the boys with the test tubes are cooking up something from alcohol, gasoline, corn, wheat, and what have you. And the Diesel is keeping the costs down on the farming end of this Guayule project.

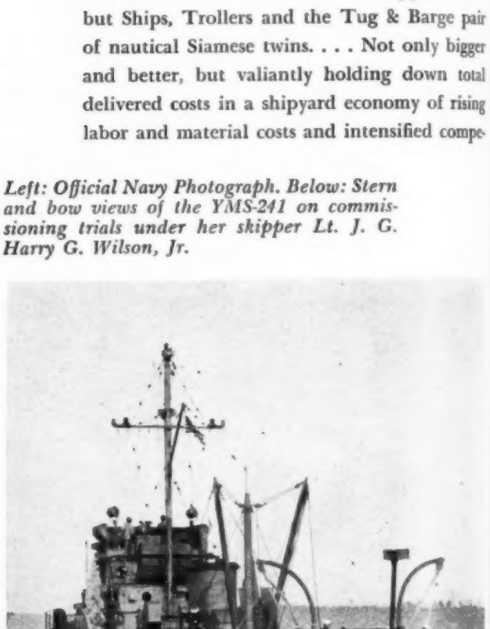
The U. S. Forest Service has not waited on ceremony and red tape, but has established all kinds of records for speed in this work.

WOOD AND DIESEL GO TO WAR AS YMS-241 JOINS THE "400"

By CHAS. F. A. MANN

BARELY two short years ago the sprawling Pacific Coast wood & Diesel shipbuilding industry was busily engaged in building bigger and better Purse Seiners, Tuna Clippers, Halibut Ships, Trollers and the Tug & Barge pair of nautical Siamese twins. . . . Not only bigger and better, but valiantly holding down total delivered costs in a shipyard economy of rising labor and material costs and intensified compe-

Left: Official Navy Photograph. Below: Stern and bow views of the YMS-241 on commissioning trials under her skipper Lt. J. G. Harry G. Wilson, Jr.



tition between America's vast Diesel Engine industry which had rediscovered the Pacific Coast commercial boat market on a large scale after the bustup in 1929.

A lovely scene. Warmongers were supposed to be getting too excited about Japan and Hitler was still a rebroadcast, translated speech that frightened Mr. & Mrs. European and gave Mr. & Mrs. America a pain in the neck along with a vicarious thrill of terror.

The Pacific Coast shipbuilding industry had not yet gone to War, and prices of fish were rising and thousands were recouping lost fortunes in one season of fishing. The Maritime Commission was puttering with C1's, 2's & 3's and Waterfront Sages predicted in February, 1941, that Uncle Samuel would't build very many nasty old Liberty ships when the CI's were so nice, and the 6,000 unit new Navy Mosquito Fleet was still on the drawing boards. If anybody had said Diesel Engine firms like Atlas, Superior, Enterprise and others would be producing Diesel engines on a production line within one year, or that General Motors would burst like a bombshell into the medium size marine field with their refined, ever shrinking, high speed 2-cycle Diesel, they would have been called loco. And if you had told a North Pacific Coast Shipbuilder that within 6 months you would be bringing Southern & Midwest Hardwood timber by the trainload to the Pacific Northwest for making bent framing for wooden ships right under the nose of King Douglas Fir, or they would be shooting scouts into Central and South America to dig up tropical hardwoods for ditto purposes to create newer and light-weight, thin-section hulls with bronze metal stiffening bands, he would have shrugged his shoulders and said you had been reading Fortune magazine or one of the Plastic ads or just spit on the deck and said nothing!

But the War of the World of 1943 is on, and the most comprehensive and far-reaching change ever to hit any group of shipyards has come, and settled down on the North Coast shipbuilding industry—which does unbelievable things right beside a new steel ship industry that uses pre-fabrication, welding and burns its plates to trim instead of cuts them with tools! Some 65 shipyards are building YMS, and PC boats for the Navy, and three or four rugged types for the Army, plus unheard of types of huge barges, Diesel-electric tankers of steel in yards that only built them of wood. The Mosquito fleet of the United States Army and Navy, will, by the end of 1944, be larger than the auxiliary mosquito fleets of all the rest of the principal world nations.

Think that over, for it is the end-result of all the things the technicians, draftsmen, dreamers and mass production experts have been yelling at you in stories and advertising for the past 15 years, and that Day of Days is here, and the production line reaches from Cleveland, via fast railroad freight, to the waterfront of Tacoma, Washington, typical and largest boatbuilding city on the Pacific Coast, where over two hundred wood and Diesel ships will be built in 24 months in ten boatyards, all of whom once littered the seas with fishing vessels and tugs.

And so it is with the rest of the Pacific Coast. Tonnage figures for Battleships, Destroyers, Tankers and Liberty Ships look fine, but keep in mind that there are 5 times as many shipyards turning out seven times as many ships as the big yards do, and that John Public is only aware, generally, that the business of pleasure Yachting is a suspended industry and he cannot buy spare parts for the "Gloria Q" any more—unless he has loaned that family pet to the Coast Guard. . . .

The *YMS* type of ship is the successful outcome of demand for a fairly shallow draft, easily maneuvered ship of definite characteristics for capturing and destroying submarine mines, largely via elaborate detection apparatus and a Degausing system based on a power plant suitable for a good size village. The very nature of the work this type does for the Navy—clearing channels for the big ships to pass through, lends itself to sturdy wood construction. And Diesels go nicely with wooden hulls —so nicely in fact that it would be almost impossible to build them were it not for the Diesel Industry.

Throughout both coasts of the USA, *YMS* ships were ordered at first in small batches commensurate with the apparent capacity of each small yard, then followed by larger orders based on the performance of these yards on their initial order. This gave enterprising boatyard operators a fair chance to build adequate shipyards right while they were doing their first order of YMS boats. Because their construction is very similar, early 1943 will find many yards going over to the PC Subchaser ships, modified, speedier wood & Diesel boats actually simpler to build than the YMS minesweeper types.

Tacoma has received a total of over 50 of these *YMS* minesweepers, the Tacoma Boatbuilding Company, noted local partnership managed by Messrs. Arne Strom and Haldor Dahl, personally, having received a total of 12

Arne Strom, co-partner Tacoma Boatbuilding Company at the wheel on builder's trials. Note full pilot house control, Weston tachometer and Sperry electric steering and Gyro compass, as well as hand wheel.

of these $750,000 marvels of compact planning and equipment. It too built a bigger covered shipyard and a modern machine shop and a fancy office for the Navy and installed one of those lovely accounting systems for which the Navy Payout Dept. is famous, and for which American paper mills must run overtime to supply the red paper out of which Form 809564-W in Octuplet is made up, with nice Navy Inspector quarters on the top floor, a Navy Warehouse and a beautiful hand carved Douglas Fir Flagpole over which this yard proudly flies the Army Navy E Pennant,—only yard in Tacoma now flying it, the Todd-Seattle-Tacoma shipyard not excepted. . . .

Quiet Arne Strom unobtrusively spends 12 hours per day with his picked, contented crew of 350 men, in absence of his Partner who has been seriously ill and away from the job for 4 months. His office is a 9 x 12 with two chairs and a desk, and he rarely sits in it, preferring to speed the work in the yard and inspect each part as it goes into the ship. Shipyards may featherbed with lazy labor on a Cost Plus dream, but not Tacoma Boatbuilding Co., and that's why the Navy awarded the E Pennant, and were genuinely glad to cooperate with DIESEL PROGRESS in revealing in detail the splendid features of a brand new *YMS* ship for the first time. For which this Correspondent is grateful.

And we hasten to pay a complement to Lt. (not jg) Fred J. Horne Jr., Assistant Supervisor of Shipbuilding for the 13th Naval District, for his cooperation and help and for his 7 day per week efforts that have speeded up delivery of the *YMS* ships produced in four yards in Tacoma Harbor establishing a series of local records.

Every purchasing facility is used to assemble

material, including the new Wheeler YMS Purchasing Corporation in New York. Douglas Fir for planking and the 108 ft. solid, one-piece keel, and Douglas Fir Plywood of all thicknesses and sizes is assembled from local Mills throughout the Northwest. Hardwood for framing, mostly Oak, comes overland by rail on the fast freights. Not a single spike or nail goes into the hulls—everything is bolted, including ribs, planking, decking etc., a costly, slow eye-opener to local shipbuilders used to galvanized iron spikes. *YMS-241* was delivered to the Navy February 20, and has the very last word in refinements gained through modification of the original specifications, including a more flared bow; single stack with all uptakes in one shell; substitution of plywood for metal deckhousing to save plate steel—even deckhouse bulkheading, walls and flooring and outside deck covering (Super-Harboard Waterproof Plywood); a new type of all-direction Venturi screen atop the flying bridge to create a dead air pocket for the Officers on duty and eliminate glass windshield, and the latest type, lightweight General Motors 2-cycle 8 cylinder Diesel propulsion and Special Services Auxiliary plant. These new lightweight GMC Diesels are marvels of compactness and neatness, barely 3 feet above the engine room floor to top of cylinder covers, absolutely vibrationless and give off a clear exhaust at all speed ranges, and with their Joes reverse gear and reduction gear can go from full ahead to full astern in 30 seconds.

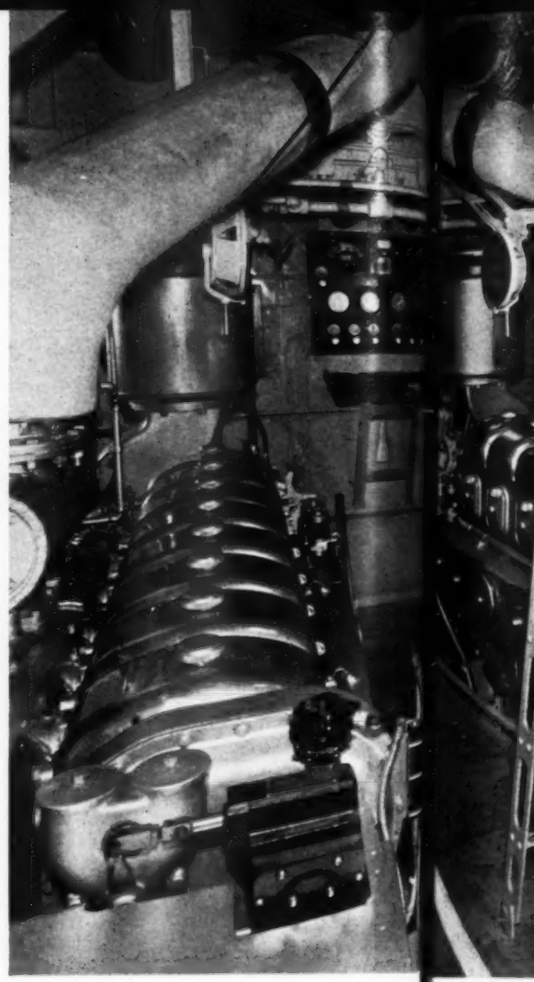
YMS-241 is 136 x 24 x 7 ft., and has 3 x 5 in. and 3 x 4 in. bent oak framing laid double; a double planked Fir hull with 1 inch inner planking and 2 inch outer planking, and a 1 piece Fir keel 108 ft. long, (all Eastern yards use laminated Oak keels with many pieces), and the sternpost is of Oak. Diagonal bronze band strapping is fitted to give extra longitudinal strength and deck planking is Fir 2¼ x 3¼ inches dimensions. Plywood for the entire deckhouse is from ⅜ to 1 in. thickness, screwed together with bronze screws and given only nominal coats of paint as it is perfectly waterproof even when submerged. This feature adds to the effectiveness of the Degausing apparatus and detection power, due to the non-conducting properties of the wood.

All furniture for the ship is made by craftsmen right in the yard, including built ins, drawers, desks, tables, chairs and cases & shelving, and all machine work on shafting, rudder parts, engine foundations and auxiliary machinery and deck equipment foundations are made in the Tacoma Boatbuilding Co.'s own shops. Rudders are of cast bronze, hollow, and the 4 ft. Coolidge propellers and propeller struts are made by that famed firm in Seattle. A Sperry Gyroscope Compass and Sperry Hand-Electric steering gear is fitted, which with its sensitive and fast action and the use of double rudders makes it possible to turn the *YMS-241* in three times its length at full speed.

The characteristically high pilot house rises sharply from the forward gun deck, with an open flying bridge atop, where actual sweeping operations are carried out. Compasses both Gyro and Magnetic are provided here, as well as a 6 inch bronze tube leading directly below to the pilot house permitting both speaking and visual communication below, so that the Officer on watch may observe the angle of the rudder at all times.

The pilot house has the entire center of control for every movement of the ship, and her detection gear, with both manual and electric steering gear, full controls for both main engines, including reverse and speed levers, Weston Tachometers for both the propeller shaft and main Diesels, and the usual Engine-room telegraph, plus fire detection and communication facilities to every part of the ship. Depth Charge firing controls, radiophone, etc. are all centered here. A compact but elaborate radio shack and a chart room are directly aft of the pilot house, on a lower level.

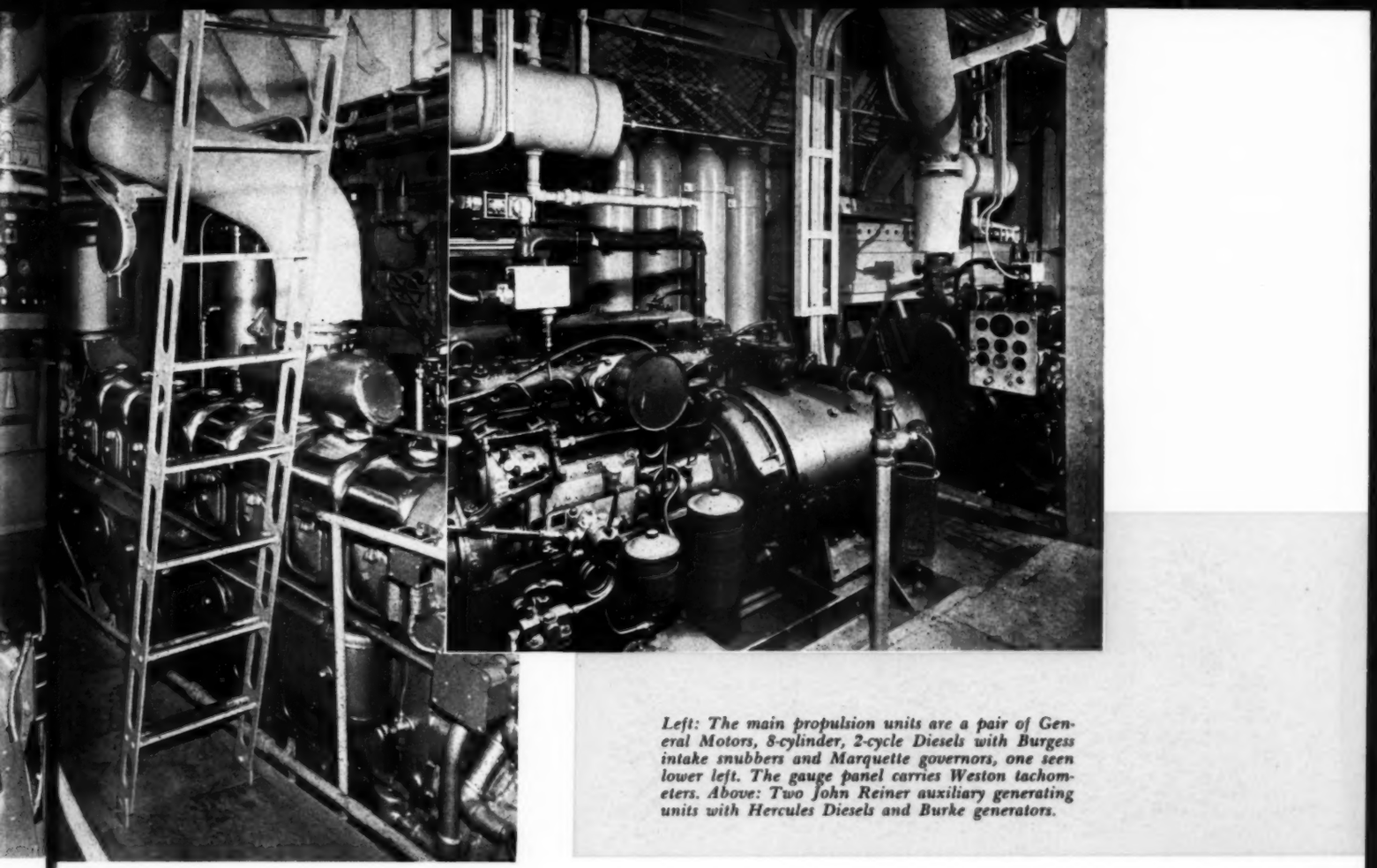
The main deck, following the bo'sn's locker and lavatory and shower room, is an ammunition ready room with rifle rack capacity for the entire crew of 29; a miniature first aid room, followed by the crew's mess, followed by the electrified galley. Control valve for flooding the magazine is located here, as well as passageway below to the tight crew's quarters. An Edison Electric range and electric coffee maker, plenty of lockers and a Seegar electric refrigerator and electric water cooler and roomy sink are included in the layout. It must be remembered that space on these ships is at a premium, comparable with that on a submarine. Headrooms are low, doors narrow and space and weight saved wherever possible. Water supplies of only 1400 gallons are carried, to cut down weight, and a fully automatic seawater distiller with a capacity of 15 barrels of distilled water per 24 hours is fitted. This ingenious stainless steel unit uses 4000 watts of electricity and was made by the E. B. Badger & Sons Co., and uses the hot pressure vapor system. A Roots type compressor driven by a motor creates a mild vacuum over the hot seawater, to reduce boiling temperature and compresses the vapor sufficiently to condense it into hot water, and feeds it directly into the fresh water system.



Aft of the crew's mess-galley space is a tiny Ward Room for the Officers and a pair of staterooms, one for the Captain and the other for the next two Junior Officers. This area has a complete bath facility, miniature safe and desks, library, dining table and radio receiver etc. all built-in. Every inch of space is utilized for storage and it is amazing to realize how much can be crammed into so little space.

Below aft are the main and auxiliary engine rooms, fuel water and lube storage, storage areas etc. Above, for the entire balance of the deck space, is the mine sweeping gear etc.

The main engine room carries two 8-cylinder, 6½ x 7 in., 2-cycle, General Motors Diesels, delivering 500 continuous horsepower at 1270 rpm. and driving through a 2.54 to 1 Joes Reduction and Reverse gear, turning the propellers at about 460 rpm. Marquette Governors, Briggs clarifiers for the lube oil, Fulton Sylphon temperature regulators, duplicate Weston tachometers in the engine room, Brown pyrometers, Harrison heat exchangers, Purolator oil & lube filters and Burgess air intake silencers and a Burgess Silent Zone telephone booth are some of the items of equipment fitted. If desired the main engines can be controlled by the man on watch in the engine room, as well as via



Left: The main propulsion units are a pair of General Motors, 8-cylinder, 2-cycle Diesels with Burgess intake snubbers and Marquette governors, one seen lower left. The gauge panel carries Weston tachometers. Above: Two John Reiner auxiliary generating units with Hercules Diesels and Burke generators.

the Pilot House controls. The Officer on watch wears a headset with a long cord and is in constant, quiet telephonic contact with the pilot house. The propeller shafts work through Goodrich Cutless stern bearings.

The auxiliary engine room, as large as the main engine room, is bulkheaded off by itself, accessible only from the top, and its principal features of equipment actually take up more space than the main power plant. A separate crew stands watch on this side, also in direct contact with the pilot house. Two Gardner Denver electric driven air compressors are fitted in the main engine room, being the only major equipment outside of pumps not confined to the auxiliary space. Main feature here is another 8-cylinder 6½ x 7 in. General Motors Diesel driving the elaborate special services generating equipment, and rated up to 540 kw. capacity. Two identical John Reiner Auxiliary generating units of 30 kw. each provide current for the entire ship, including deck machinery, marvels of automatic compactness, each with its own miniature control panel, auxiliaries and cooling equipment. The Auxiliary sets are powered with a 3¾ in. x 4 in. Hercules Diesel, developing 62 hp., at 1600 rpm., and driving 220 volt Burke Electric Co. d.c. generators, and having a Timken Governor to maintain constant voltage under varying load conditions. They each have American Bosch fuel pumps, Harrison heat exchangers and Purolator oil filters. The ship's elaborate electric system uses Westinghouse and G.E. switch gear and Cutler Hammer control equipment, and a very elaborate main switchboard centralizes the ships distribution system. An Ingersoll-Rand fresh water and an Ingersoll-Rand salt water pump is fitted, as well as Northern fuel oil pump and General Motors lube oil pump. A Bethlehem Foundry & Machine Co. small size, very efficient 250,000 Btu. heating boiler, oil fired, is fitted beside the water distiller, for all ships heating; Deming Self Priming 50 gpm. fire pump and a large Briggs oil clarifier are fitted in the auxiliary engineroom.

A Lux CO2 Fire System, by Walter Kidde, is provided, and Ams-Franklin Anchor Winch with two 300-lb. Danforth Anchors.

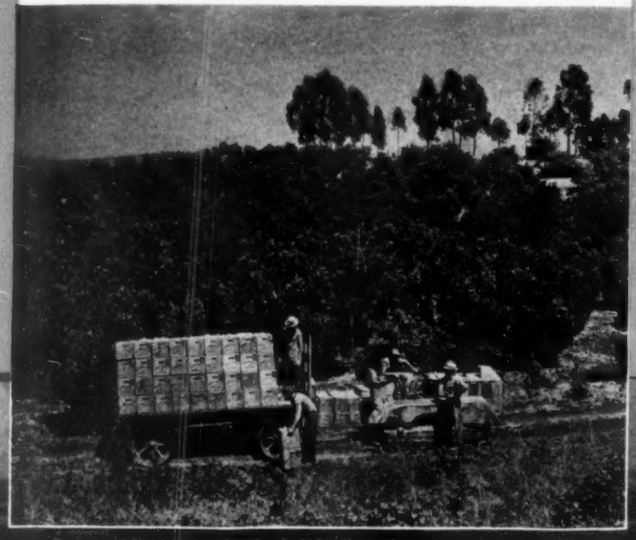
After acceptance by the Navy, much elaborate armament and special equipment is fitted, in addition to that installed by the builder. But the builder installs all foundations and lays out everything ready for a quick final fitting and placing of secret Navy equipment at the Puget Sound Navy Yard, before she sails in the line somewhere on the seven seas.

Speeds may still be a Navy secret, but the trial run Skipper, none other than Mr. Arne Strom himself—an experienced and clever navigator, smiled when we passed 12 knots, then past 13, then past 14—and so on!

YMS-241 was the first of the new type Minesweepers finished in Tacoma, and the first with full General Motors new type Diesels. Her crew, assembled from 15 different States, was loud in her praise, and Skipper Harry G. Wilson Jr. beamed as she sailed away to join the big ships of the Line, somewhere in the Pacific. . . . A job well done.

Machine gun on upper deck.
Official Navy photograph.

Above: Diesel tractor driving a bean thresher, harvesting 2,500 acres. Fuel cost 18c an hour. Right: One of two Diesel tractors on the C. G. Raymond, 70 acre ranch, Ojai, California, spraying oranges. Below: Hauling oranges, 120 boxes to load, working two 12-hour shifts, this Diesel tractor uses less than two gallons of 4½c fuel.



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DIESELS IN THE BREAD LINE

By JIM MEDFORD

THROUGHOUT the Pacific Southwest, the national farm labor shortage of more than 2,000,000 workers has been steadily creating a demand for low cost power to bridge this gap.

In addition, figures recently released by the United States Department of Agriculture pointedly indicate our changing food habits with emphasis on the increased consumption of certain orchard and field crops: citrus, beans, peas, nuts, sugar, and vegetables.

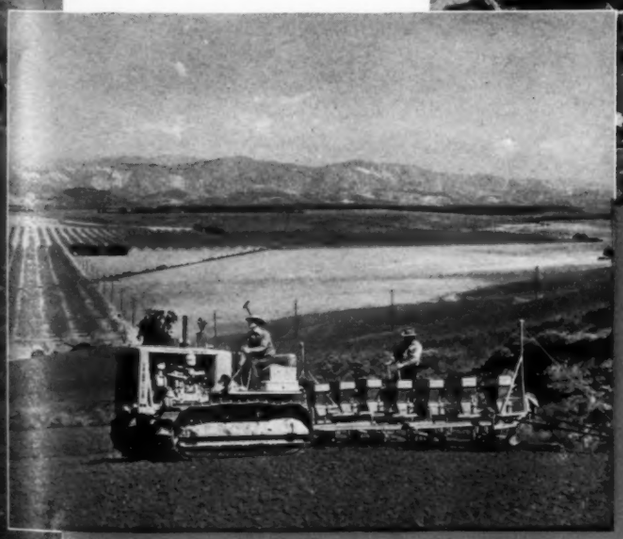
In passing, it is interesting to note that whereas citrus fruit consumption has increased 200 per cent since 1909, other fresh fruits have fallen off 8 per cent. Butter has just about held its own, while other dairy products have taken considerable lead. That old standby "meat and potatoes" was down even before the present shortage. And coffee—remember it?—has increased 70 per cent, as of last year. Hijackers only now get more than one cup. Southern California is particularly affected by this increased demand, and, to a large extent, is prepared for it, too.

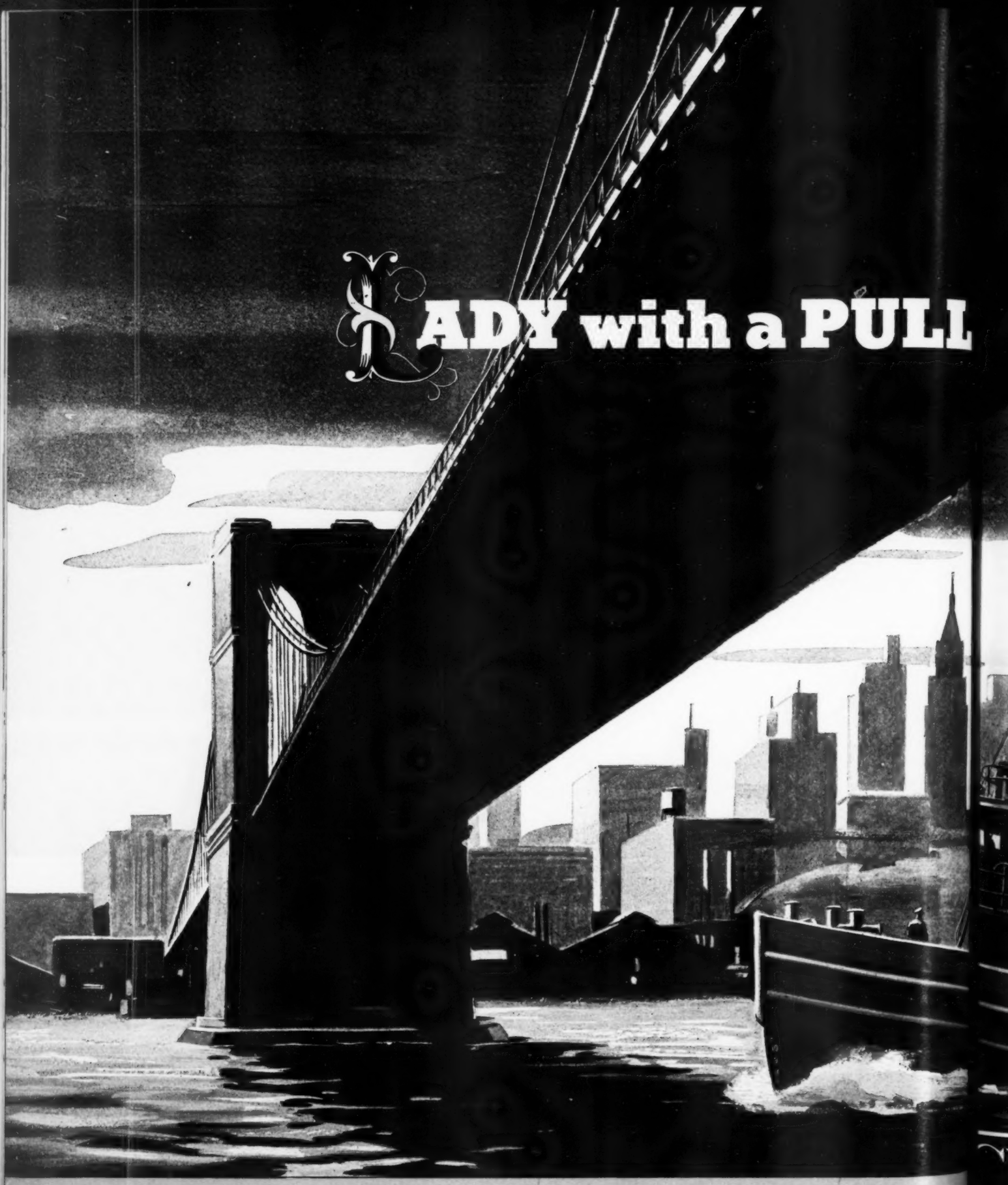
This is so because, ever since the introduction of the first successful Diesel track-type tractor in 1931, the ranchers in steadily increasing numbers have taken advantage of its unequaled economy. Here, where agricultural work has reached a high state of development, there are innumerable large and small ranches that would not be profitably operated were it not for the versatile Diesel tractor. Using both drawbar and belt horsepower, ranchers keep their "cats" busy the year round—plowing, seeding, threshing, and irrigating.

California's percentage production of the nation's whole, include: citrus, 70 per cent; field beans and peas, 37 per cent; sugar beets, 29 per cent; tree nuts, 4 per cent. These crops are specifically mentioned because, in addition to having a total annual value of $132,000,000, they are representative of the southern counties production, demanding specialized treatment. For instance, Orange county in 1941 provided its ranchers with a fifty million dollar orchard, truck, and field crop. And in the accompanying illustrations we have graphic picture of how the Diesel in the bread line is promoting the health of a nation that must feed and serve the famished world.

Left: Farming 1,600 acres near Camarillo, California, J. V. Smith, owner, reports a saving of two-thirds the fuel cost of gasoline tractors with these Diesels. Below: Diesel tractor hauling an eight row lima bean planter; covers 75 acres in ten hours; uses 45 gallons of 5½c fuel per 24 hours.

Left: S. W. Beasley, Pomona, California, working a Diesel tractor with 12 ft. basin lister in his 500 acre walnut grove. Below: This Diesel tractor-driven deep well pump supplies water for 21 acres.





BUILT to do the toughest kind of harbor and deep-sea towing, the Christi
Moran is powered with a GM Diesel. Other Moran tugs, Army, Navy, Co
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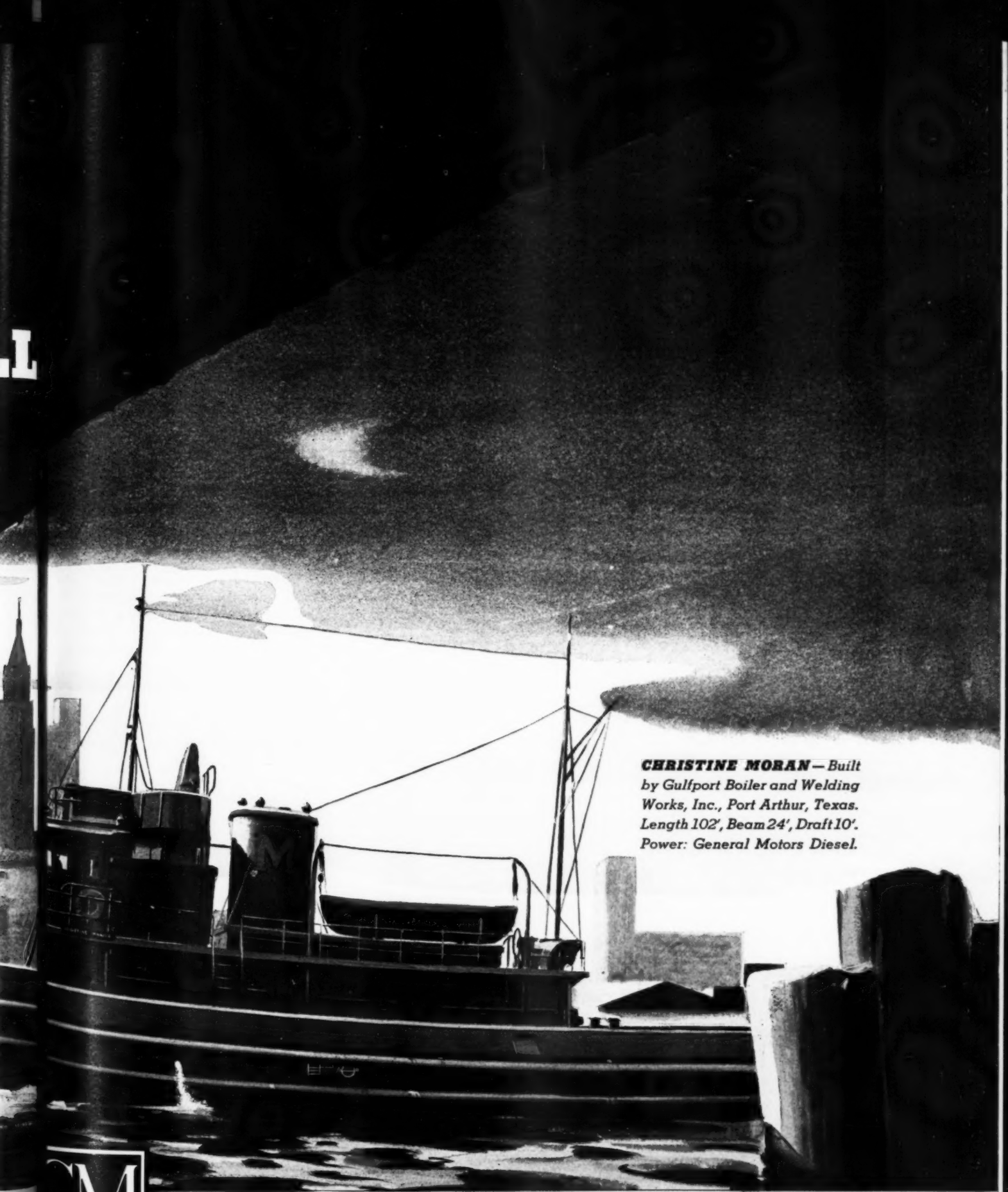

CHRISTINE MORAN — *Built by Gulfport Boiler and Welding Works, Inc., Port Arthur, Texas. Length 102', Beam 24', Draft 10'. Power: General Motors Diesel.*

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Maintenance and its Relation to Production

By R. L. GREGORY

THE writer recently heard an operating engineer pass this remark: "Why is it that our Engineering Magazines are devoting so much space to Maintenance and Maintenance problems these days? It seems to me that any engineer would realize that he must maintain his equipment if he expects it to operate, so I see no particular need in continually harping on the subject."

That question can be easily answered. In our efforts to win this highly mechanized war, the one essential objective is production, all out production of the materials necessary to carry on to a complete victory. Modern warfare is different from the days of our grandfathers. It is totally mechanized and when you depend on mechanical equipment you must give the problem of Maintenance your first consideration and attention.

This point not only holds true to the mechanical equipment of modern warfare, but it also holds true to the shops, power plants and the industry which produce that equipment. Many engineers realize that, and have excellent intentions in carrying it out, but then too we are burdened with many others who always want to put off until tomorrow, the things that should be accomplished today. Repetition of an idea is one sure way of putting it across. Hence the continual harping on Maintenance.

Since Maintenance is the one essential factor which will help us put our best efforts into production, the maintenance engineer and his crew must realize the burden which they are being forced to carry. Maintenance has many objectives, and in order to obtain satisfactory results from your maintenance work it should be gone at on a thorough and systematic basis.

A complete record of Maintenance should be kept at all times in any plant. The first step should be a complete list of every piece of mechanical or electrical equipment in the plant, so listed that all the available data are at your finger tips. This includes the name of the equipment, type, size, serial number, and any other identifying data which will make it easily recognized. These data are particularly valuable in ordering replacement parts from the manufacturer. Much valuable time can be lost in delayed correspondence about a certain piece of equipment, when all these facts are not given on an order. We have all experienced that situation.

Accompanying such a list should be a maintenance record on each piece of equipment, showing when it was last inspected, the condition of the equipment at the time of completion of maintenance work, and a date set for the next inspection. Also any unusual features should be noted. In other words a complete history of that piece of equipment should be available.

The primary object of maintenance is to eliminate interruptions to service by eliminating failures in equipment. Bearings should not have to start knocking, pistons become overheated, so that temperatures rise beyond all normal conditions, coolers and cooling systems plug up, before given attention. While mechanical equipment must be given all consideration in your maintenance schedules, electrical equipment demands its full share of attention, since it is very allergic to dirt and dust which it accumulates from the surrounding air.

As an illustration: While installing some new generating equipment in a large industrial plant several years ago, a department foreman sent for me one day, and told me that he would like to have me inspect a large motor which was operating the line shaft in his department. He said that for the past month his volume of production was falling off and he could not account for it, unless it was in the motor and he knew I had full equipment for checking up on the motor.

I went to the department and upon inspecting the motor, immediately suggested that he dismantle it at the first opportunity, and give it a thorough cleaning up, since it was covered with dust and residue from a polishing room nearby. Later in the day he again sent for me, as the motor began to smoke and show signs of distress. I had him get a crew and we dismantled it, and found the rotor and stator so plugged up that it would hardly operate. We cleaned it out thoroughly with air and carbon tetrachloride, then gave the coils a good coat of insulating varnish, reassembled it and put it back in service. The next evening he met me and stated that they had turned out more than their full quota for that day. His trouble had been faulty maintenance.

Transformers, motors, oil breakers, pumps, compressors etc. should be regularly inspected and maintained to see that they are up to standard, and not neglected to the point where signs of failure and fatigue make it necessary to perform regular maintenance work. Large slow speed generating units, which have fans for circulating air through the windings will gather a surprising amount of filth and dust from the surrounding air and deposit it upon the coils and rotating element. Make it a practice to keep these parts clean, such as the one shown in the accompanying illustration.

Electrical equipment such as transformers and oil breakers should have regular inspection of the oil. Oils have a tendency to congeal with age and often moisture is present. This emulsion of oil and moisture breaks down the dielectric properties of the insulation and often causes unforseen trouble. Periodical inspection, filtering of the oils or renewal of the oil eliminates the possibility of failure.

. . . . *And now please turn to page 56* . . . .

This view emphasizes cleanliness of generator coils and rotating element.

DIESELS CLIMBED MOUNTAIN TO BUILD ATOM CRACKER

By

F. HAL HIGGINS

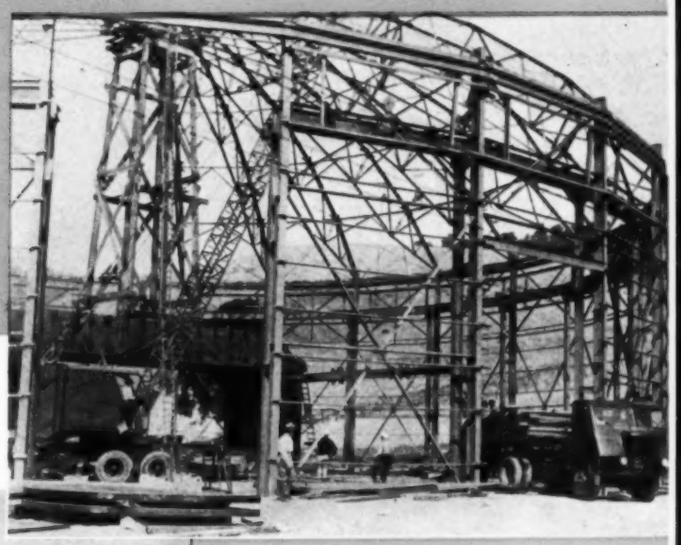
WHETHER that itty-bittsy atom is going to be what it's cracked up to be or something else again when the world's greatest Cyclotron is completed and put to work, only time and the scientists working with it can prove.

Guesses now range all the way from engines you can carry in your vest pocket to Super Man guns that will knock the giant battleships out of sky and water to finish the present little fuss started by Adolph some three years ago. Many of tomorrow's new industries will undoubtedly spring from this and other Cyclotrons to be erected to peer into the secrets of Nature. Already, from the smaller and older Cyclotron used by the staff working in this field at the University of California have come facts that assure a certain standard mineral content of milk that can be applied to the feeding of every dairy cow.

The erection of the University of California Cyclotron was started more than two years ago and its completion and operation by early 1944 was in the original program. War has shut off all reference to it and its work, naturally.

Undoubtedly, it has been turned to the war effort with military problems to crack. With 4500 tons of steel going into its erection at a cost of well over $1,000,000, there was a transportation problem of getting the big slabs of steel up the mountain back of the University football stadium where it was located. The rise from sea level to about three-quarters of a mile is over a distance of only three miles from from the water to the site. But that last mile and a quarter is a steep one with plenty of hairpins and "devil's elbows" on unpaved dirt roads that weren't helped by winter rains.

Bigge Drayage Co., Oakland, was given the transportation contract and purchased two new Cummins Diesel engined Autocar trucks for the job. These trucks carried twenty-five tons of steel each trip—ten steel slabs weighing 2½ tons each, negotiating the rain-soaked mountain road and backing into position over litter and rutted ground without a hitch. They handled the job so easily that when Mr. Bigge was questioned about their performance on this job, he thought the performance uneventful and merely routine. However, to one who watched them coming up the mountain with those 28 ft. steel slabs that were later lifted and welded into the giant arch over the center, they were magnificent. Their backing into the spots for unloading was sure and uncanny. They were the pride of their drivers, who swore they were the best heavy duty outfits they'd handled.



Seen here are the semi-completed frame of the Cyclotron dome and the Autocar, Cummins Diesel engined trucks that hauled the 4500 tons of steel ¾ mile up, in three miles of going, to build this million dollar structure to house an atom smasher.

Exchange Your Diesel Maintenance Ideas

Conducted by R. L. GREGORY

Editor's Note: In this department we provide a meeting place where Diesel and Gas engine operators may exhcange mutually helpful maintenance experiences to keep our engines in top condition. Mr. Gregory edits your material and adds constructive suggestions from his own wide experience. This is your department —mail your contributions direct to DIESEL PROGRESS.

Detection and Correction of Extension Shaft Alignment on Diesel-Driven Units

DURING the course of Diesel Engine inspections, over a period of years, I have frequently found a case of misalignment on extension shafting for generators and other drives. In many cases, this alignment has varied from .003″ to .010″. This misalignment is usually detected by placing a strain gauge at a given point between the crankshaft web next to the extension shaft.

While working on the test floor of a Diesel Factory and after going into Diesel erection work, we were always particular to get the alignment of an extension shaft as nearly perfect as possible, throughout the entire length of the crankshaft proper and extending along the extension shaft to the outboard bearing.

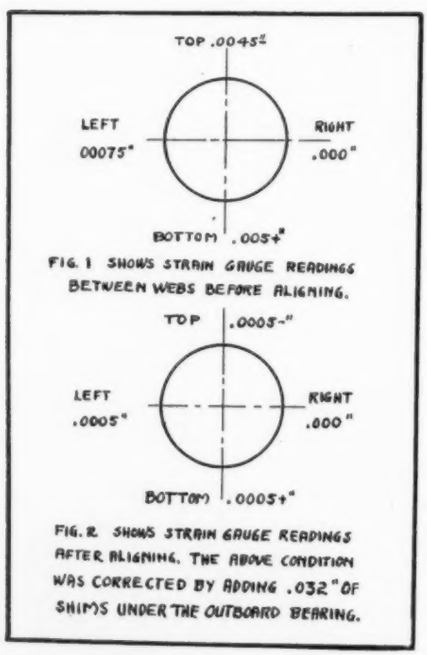


FIG. 1 SHOWS STRAIN GAUGE READINGS BETWEEN WEBS BEFORE ALIGNING.

FIG. 2 SHOWS STRAIN GAUGE READINGS AFTER ALIGNING. THE ABOVE CONDITION WAS CORRECTED BY ADDING .032" OF SHIMS UNDER THE OUTBOARD BEARING.

A misaligned extension shaft, bolted to the crankshaft proper, not only causes undue and excessive wear on the bearings, but sets up excess strain and stress upon the shaft metal which may lead to fatigue cracks. The accompanying sketch shows readings taken with a strain gauge placed between the web on a unit recently inspected. You will note a difference of .0095″ between top and bottom readings, and only .00075″ lateral difference which is negligible. In this particular case, the extension shaft was on a generator and was approximately 10 feet long. The throw of this shaft at the outboard bearing was approximately .040″ or .020″ to a side.

After correcting the alignment to the position shown in Fig. 2, this throw was practically eliminated. Operating a generating unit with a misaligned extension or generator shaft is a positive detriment to the generator itself, since it causes an uneven air gap condition. This condition means loss of power, more work for the prime mover, thus affecting economic operation. An uneven air gap condition also throws additional stress on the iron laminations and windings of a generator and frequently, when there is too much variation, causes a humming in the lamination due to uneven pull.

Whenever we find a condition of extension shaft misalignment, we recommend that it be corrected as soon as possible. This can be accomplished easily by any Diesel engineer, if the procedure is properly followed out. Place your strain gauge between the crankshaft web next to the extension shaft. Place it squarely between the webs, at a point preferably well to the outer edge of the web. Then rotate the unit slowly in one direction, noting the readings on the quarters, top, bottom, and sides. Then rotate the shaft in the opposite direction and check your gauge readings. When you find it out more than .001″ total, correct it either by removing or adding shims or by moving the outboard bearing sideways. When the readings are practically uniform at the four quarters, with the outboard bearing tightened down, you may be assured that the extension shaft is properly aligned.

Any extension shaft is likely to get out of alignment even though in perfect alignment at the time of installation. This is due to either vibration of the unit, or faulty foundation conditions, such as settling, etc.

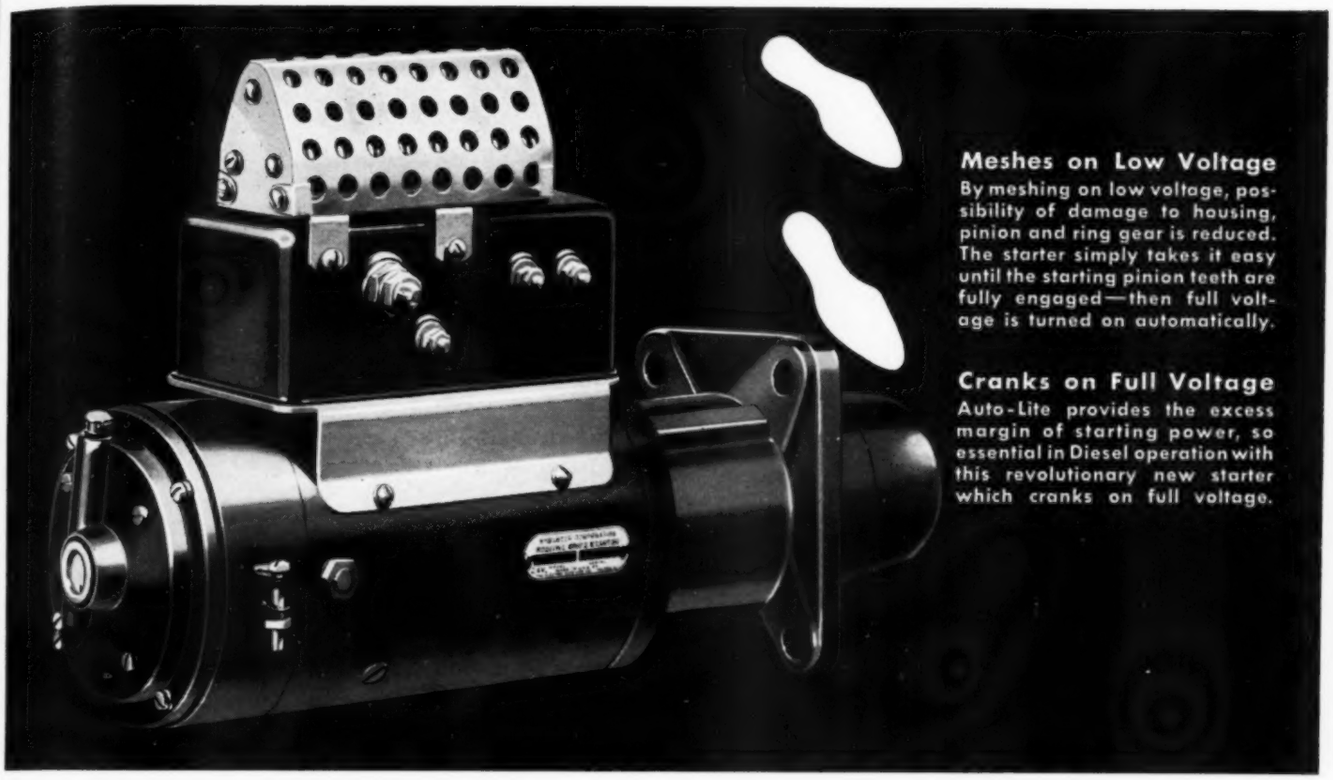
Suggestions on Maintenance of Close Clearance Equipment

AS time goes on it is becoming increasingly difficult to secure replacement parts for maintenance and repair work on our units. This seems to be particularly true on such parts as are made from high grade metals which work with close clearances. I have in mind such parts as fuel valves, fuel pumps, air governors, etc. Due to increased production along other lines, the ever increasing diversion of high grade materials to war necessities and the increasing demand on skilled mechanics' time, these parts are often found not to be up to the standard of parts furnished in normal times.

With this in mind, the operating and supervising engineers must get every minute's wear out of this equipment which can possibly be obtained. Just as an example of what can be done to secure longer life and service of such parts as mentioned, let's consider the check valves in an American Bosch fuel pump. Those familiar with the construction of the American Bosch fuel pump, know how vital it is to good operation to maintain these check valves in perfect operating condition at all times.

With every stroke of the pump plunger there is an opening and closing movement of these check valves. If your fuel oil has any abrasive qualities in it the wear and tear on these checks will increase more rapidly than the normal wear caused by this movement. If these checks become stuck, the fuel pump becomes ineffective and you soon run into trouble with that particular cylinder or piston due to ineffective firing.

Therefore these check valves should be removed periodically, the length of that period depending upon the hours per day the unit is in operation and the kind of fuel you are using. It is always good policy when outage periods are of short duration, to have two sets of check valves for each fuel pump, one in operation and the other in a good state of maintenance so that it can replace the one removed for inspection and maintenance. After one of these check valves has been in operation for a period of time, upon removal you will note that ridges or shoulders develop on the sides of the valve guide. When these become too pronounced



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they often cause the valve movement to become sluggish, and if allowed to operate over too long a period the wear becomes so pronounced that the check valve has passed the point of repair.

Hence if these valves are removed occasionally, they can be lapped in again, if this wear is not too pronounced. This should be done by first carefully cleaning the whole check valve. Then by applying a small amount of green rouge to the sides or guides of the valve, it can be lapped in and these slight ridges or shoulders removed. In lapping in the valves, the work should be done by a mechanic who is thoroughly familiar with what we might call, "The feel," of the lapped fit. By this I mean that the fit of the valve to the seat and guide should be such that it just slides smoothly back and forth in any position, there being no point at which it will stick even slightly.

One not familiar with such lapping procedure might overdo the job and get it too loose, thus destroying the effectiveness of the check itself. Do not use a fast cutting abrasive on this sort of work. Green rouge is more a polishing agent than an abrasive, hence you cannot expect to recondition such parts in a few minutes.

Another part which must have periodical attentention is the blast air regulating valve. This valve is very sensitive, and should also be taken out periodically and inspected. The valve itself is a lap fit in the bushing and since it too is in constant motion with each change of load it must be kept in first class shape. Here also the use of green rouge is very effective in keeping it well polished and to a good fit. After getting this valve well lapped in, it should be well lubricated with special lubricant.

The atomizing equipment should be inspected periodically, in order to ascertain that the openings in the atomizer rings are free of corrosion, and that the atomizers function properly in breaking up the fuel. Since there is a tendency for the needle valves to corrode at the point of contact with the seat, these should be given periodical attention and ground in with a very fine grade of abrasive compound. They then can be polished up with a finishing touch of green rouge if so desired, although this is not absolutely necessary if a good seat is secured with the fine abrasive.

Flame plates are another item to be considered. These should be removed periodically to ascertain that there is uniformity of the openings and that they are not burned or corroded in such a manner that the fuel is injected to the side rather than straight down on the piston head.

Vigilance and periodical inspection of the foregoing parts will give you much longer service from these parts and hence help you out during periods when such parts are difficult to secure.

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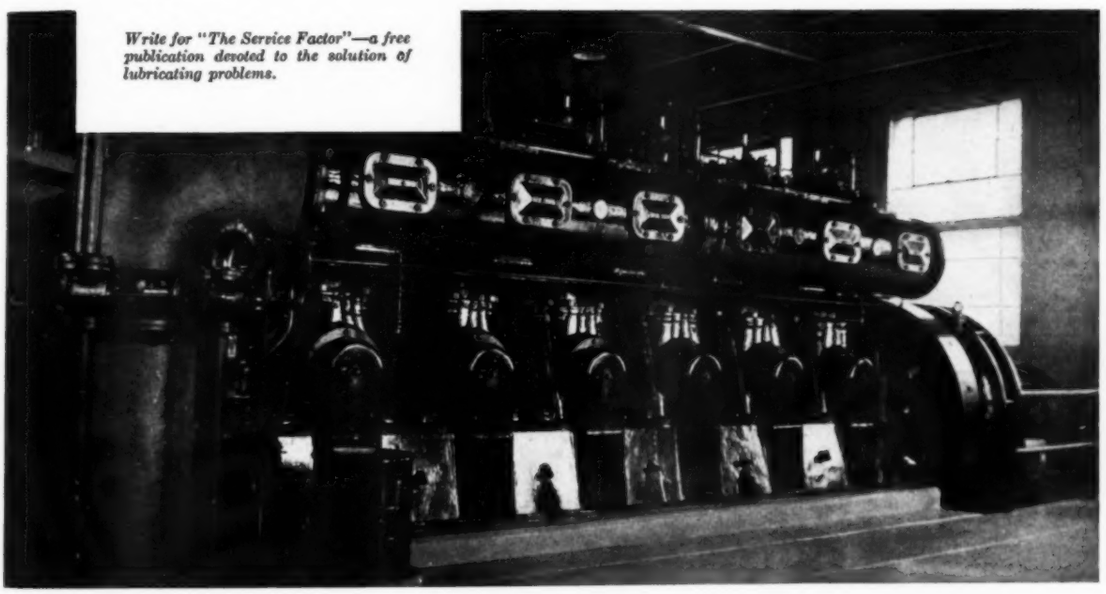

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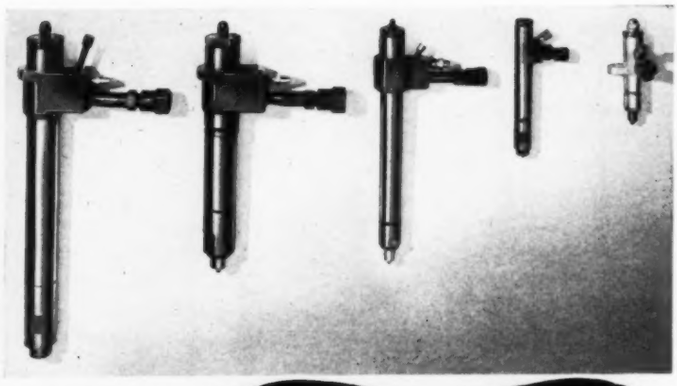

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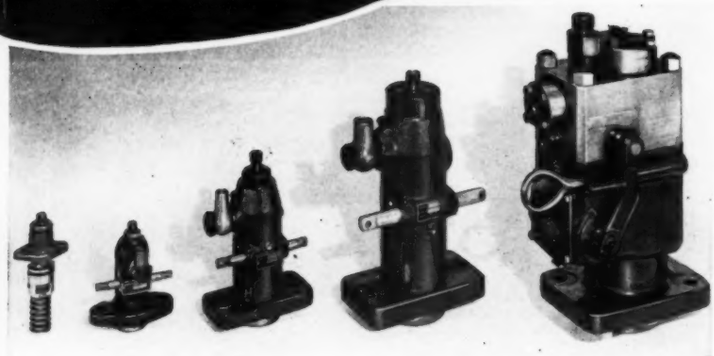

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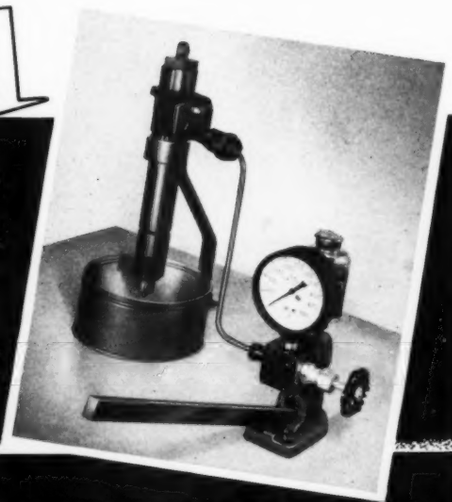

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Supervising section cont'd . . .

Most maintenance men plan on some failures due to unforeseen conditions. They provide for these emergencies by having spare replacement parts on hand, tools and equipment for making repairs in good shape and ready at an instant's notice. They do not wait until failure occurs and then start looking for materials. This policy eliminates long outage periods.

The Maintenance Engineer's greatest asset is to know his equipment and its condition at all times. He must know the load conditions of that equipment, the requirements which the equipment is expected to meet and handle, and above all there must be complete cooperation between the production end and the maintenance crews. This applies to the production of Power as well as to the production of materials.

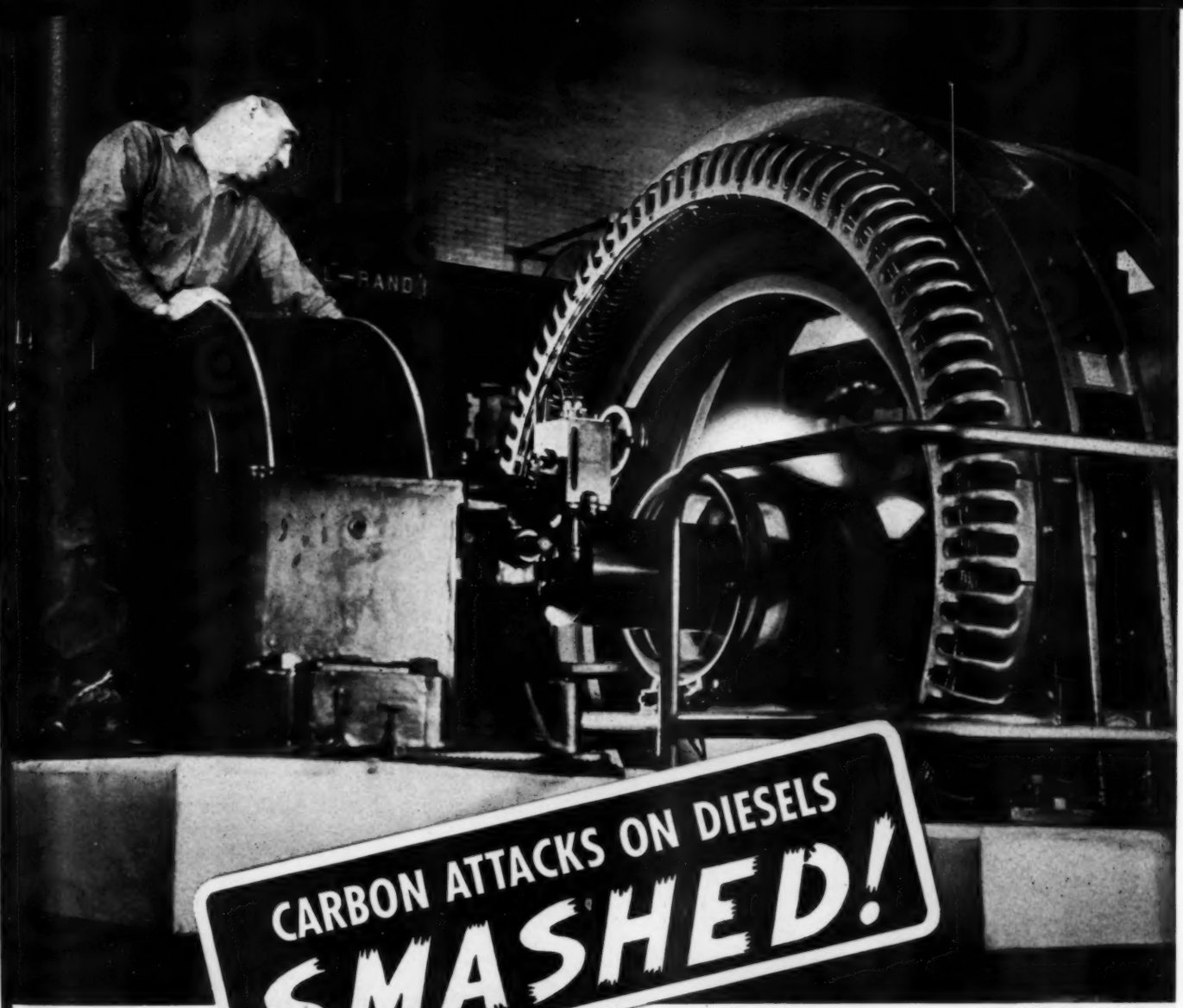
Hence the answer to the question of why we must keep harping on the idea of maintenance. It is the one essential factor vital to production, and production is the vital factor in winning this war.

Enterprise Executive Visits San Francisco Engine Plant

J. J. SWEENEY, Washington Representative of the Enterprise Engine and Foundry Company, recently spent considerable time at the

J. J. Sweeney

company's San Francisco Plant. While in San Francisco Mr. Sweeney observed the successful endurance tests on the 1200 horsepower Enterprise Diesel Engines which are now being delivered to the United States Maritime Commission.



SOLNUS OILS

"Solve carbon problem . . . eliminate fire hazard"

For 10 years the generator-connected diesels in a large plant manufacturing electrical controls were plagued with carbon. Numerous high-grade lubricants were tried—all resulting in the same trouble. Carbon accumulated to such a point that forced shutdowns occurred on an average of once every 60 to 90 days, causing serious trouble and power losses.

Then a Sun Oil Engineer—a diesel lubrication expert—recommended Solnus Oils. They solved the carbon problem . . . stopped numerous shutdowns and fire hazards . . . ended costly power interruptions.

Solnus Oils are scientifically-developed to give "top-notch" performance . . . to keep your present equipment running smoothly, trouble-free. These modern diesel oils are wholly distilled, low in carbon content, neutral in acidity, and can stand up and take it.

Call on the service of Sun Oil Engineers—those capable Doctors of Industry. Let them show you how to keep your engines at peak efficiency . . . to produce unfailing power for victory production.

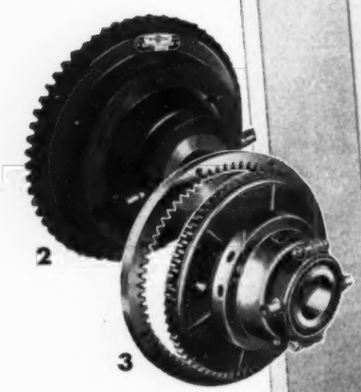
SUN OIL COMPANY • *Philadelphia*

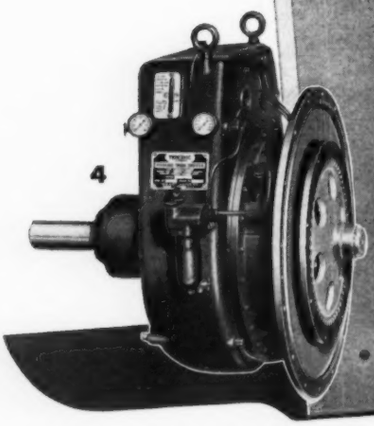
Sun Oil Company, Ltd., Toronto and Montreal, Canada

SUNOCO

SUN PETROLEUM PRODUCTS *HELPING INDUSTRY HELP AMERICA*

Friction or Hydraulic?





In the designing of new road machinery and material handling equipment, this question is being asked: "Shall we use friction clutches or hydraulics?"

To answer this question, the Twin Disc Clutch Company has available a fund of specialized experience checked with field performance; gathered through a quarter of a century of building friction clutches for specific types of service.

To this has been added ten years of research and development of hydraulic drives.

Design engineers are offered this combined experience in arriving at the answer to any particular problem which requires a connecting link between a driving and a driven unit. Write the Engineering Department, TWIN DISC CLUTCH COMPANY, Racine, Wisconsin.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
REG. U.S. PAT. OFF.

1—*Twin Disc Clutch Power Take-off.*

2—*Model E Twin Disc Heavy-duty Friction Clutch.*

3—*Model CL Twin Disc Heavy-duty Friction Clutch.*

4—*Twin Disc Hydraulic Torque Converter (Lysholm-Smith Type).*

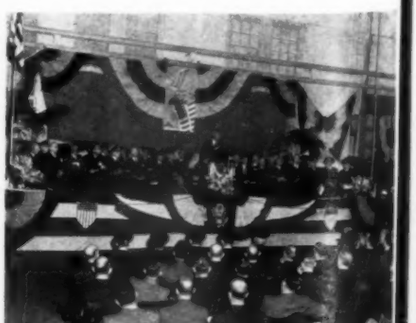
TWIN DISC CLUTCH COMPANY • RACINE, WISCONSIN

Third War Production Award To National Supply

THE National Supply Company was the recipient of its third War Production Award on February 10 with the presentation of the Army-Navy "E" to the employees of its Toledo, Ohio, plant. The two previous awards consisted of the Army-Navy "E" at the Ambridge, Pa., plant and the U. S. Maritime Commission Victory Fleet Flag Maritime M Pennant to the Superior Engine Division at Springfield, Ohio.

Presentation of the Toledo Plant Award Flag was made to President A. E. Walker by Rear Admiral William C. Watts, U.S.N., retired. "We regard it as a token of partnership with those brave sailors and soldiers fighting in the far corners of the world to maintain the rights of free men," said Mr. Walker in his acceptance speech.

Col. Ernest O. Rudelius presented "E" pins to the four oldest employees of the plant whose tenure of service ranged from forty-four to fifty-one years of continuous service. Pins were accepted in behalf of the employees by J. S. Biscay, President of The National Supply Unit, U.A.W.-C.I.O. "Our fighting sons will never falter if we do our part. Let us put on these pins in solemn compact with them," said Mr. Biscay.



Governor Saltonstall, of Massachusetts, gave the principal address and paid tribute to the workers and management in declaring, "All of us are working together on the home front as well as on the battle front."

How to Keep Your Diesels "FIGHTING MAD"

Today your Diesel is a war-engine. No weapon ever built has meant more in the all-out drive for Victory.

Your job is to keep that war-engine "fighting mad"—to drive it longer and harder than ever before. And, above all, to protect it against breakdown. For, in the total picture of war, a knocked-out Diesel is as critical as a blown-up destroyer.

One of the best ways is to use an oil that has high oxidation resistance—an oil that will not form sludge readily to block the oil passages leading to the bearings—an oil that has a high viscosity index for economy and bearing protection. These properties will be found in Cities Service Pacemaker and Penn-Pacemaker oils. They are particularly suited for the lubrication of large and intermediate size Diesel engines.

Where detergency also is required, as in high speed automotive type Diesels, Cities Service D-C "500*" series oils will be found advantageous.

For further particulars regarding these oils, or for a copy of a comprehensive booklet on "Diesel Engine Lubrication," write Cities Service, Room 1350, Sixty Wall Tower, New York, N. Y.

*Approved by Caterpillar and General Motors.

OIL IS AMMUNITION—USE IT WISELY!

CITIES SERVICE OIL COMPANY
NEW YORK · CHICAGO

IN THE SOUTH
ARKANSAS FUEL OIL COMPANY
SHREVEPORT, LA.

Gene P. Robers Appointed Advertising Manager of the Weatherhead Company

MR. A. J. Weatherhead, Jr., President, announces the appointment of Mr. Gene P. Robers as Advertising Manager. Mr. Robers succeeds Robert H. Weatherhead who has left the company to join the armed services.

Mr. Robers was formerly Advertising Manager of the Atlas Car and Manufacturing Company of Cleveland, and previous to that he was the owner of his own Industrial Advertising Agency. He has had eleven years of industrial advertising experience and is well known in Ohio advertising circles. He attended the University of Cincinnati and more recently taught the class in Advertising Principles at Heidelberg College, Tiffin, Ohio.

Mr. Robers is a member of the Industrial Marketers of Cleveland, a chapter of the N. I. A. A. and is also a member of the Cleveland Advertising Club.

ON THE ALERT!

"DL" Contact Makers are always on the alert to protect Diesel Engines from costly damage due to insufficient cooling or lubrication.

"DL" Contact Makers, especially designed to take the severe shocks and operate under the strenuous conditions of wartime service, are in use today by the thousands on all types of installations, stationary, mobile, and on our fighting ships and merchant marine.

Don't take chances these days when one damaged engine might be a stumbling block on the path to victory. See that your Diesel equipment is adequately protected with "DL" Contact Makers.

Write for Bulletins 203, 204 and 206 for full information.

DETROIT LUBRICATOR COMPANY
General Offices: DETROIT, MICHIGAN
Division of AMERICAN Radiator and "Standard" Sanitary Corporation
Canadian Representatives—Railway and Engineering Specialties Limited, Montreal, Toronto, Winnipeg

Cummins is Appointed Diesel Consultant by War Production Board

C. L. CUMMINS, founder-president of the Cummins Engine Company of Columbus, Indiana, manufacturers of Cummins Diesel Engines, has been appointed Executive Consultant on Diesel Engine Production to the War Production Board, with headquarters in Washington, D. C. The position carries the nominal dollar-a-year salary.

Appointment of Mr. Cummins to this newly created post is the direct outgrowth of a conference held recently in Washington at which time WPB officials made clear to executives of the principal Diesel manufacturers the need for increased production and urged, as a step toward this end, the selection of a man within their own ranks to undertake this important job.

C. L. Cummins

Represented in the conference were almost all of the principal builders of all categories of Diesel engines used in the war effort, including manufacturers of slow, medium and high speed Diesels covering a wide range of horsepower capacities.

Mr. Cummins was their unanimous choice because of his close association with the Diesel industry for more than a quarter of a century, and also because the products and the company which bears his name are so representative of the industry as a whole.

Commenting on his appointment on the eve of his departure for Washington, Mr. Cummins said, "All of us in the Diesel industry recognize that a definite program of increased Diesel production is essential to victory and," he continued, "we propose to do this through co-operation between industry and government. I am fully appreciative of the honor which the appointment carries and I am also fully aware

IDLE EQUIPMENT HELPS THE AXIS!

FIND A USE FOR IT—OR SCRAP IT!

Follow this rule

If it hasn't been used for three months, and if someone can't prove that it's going to be used in the next three—sell it*—or scrap it!

Here's what to look for

Obsolete machinery, tools, equipment, dies, jigs, fixtures, etc., which are incapable of current or immediate future use in the war production effort because they are broken, worn out, irreparable, dismantled or in need of unavailable parts necessary to re-employment.

*** Scrap and Used Equipment Dealers pay well for usable machinery and materials.**

NOW is the time to look over all the machinery and materials that this war has forced into idleness. Every pound of it can be helping the war effort. And if it isn't, then it's helping der Fuehrer!

SCRAP IS AMMUNITION

Look at it this way. There is, in America, the worst shortage of equipment of every sort that has ever faced us. There is an even greater lack of heavy scrap. *You* can help relieve these shortages. You can add to the Nation's productive might. You can help provide the steel that will drive the Hun and Jap back into their holes to die.

You owe it to your Country, and to the boys that face these gangster nations, to do this thing that's asked of you. And don't pass off your responsibility by saying that you've already done the job . . . *because you haven't!*

FIRST SCRAP HUNT — JUST A STARTER

Even if you've recently carried out a scrap drive in your shop, surveys prove there is always plenty that is missed the first time. You can prove this for yourself, simply by taking a careful look around. Remember — if you are hanging on to material or equipment on the basis that you may need it after the war, you're not only holding out on our fighting men . . . you're fooling yourself as well. For it's going to take everything we've got to win this war—and if we *don't* win, the stuff you've hoarded won't do you a nickel's worth of good.

If you haven't started a Salvage Committee working yet—get going now. Pick a high executive as Salvage Manager; one who has the authority to get things done. Write to this magazine, if you wish, for help in getting a real salvage program rolling.

YOUR IDLE EQUIPMENT IS 1-A

Nobody's asking you to give valuable machinery and materials away unless you want to. There's a ready market for heavy industrial scrap—it's needed in tremendous quantities to mix with the mountains of flimsy household scrap collected last Fall. Used Equipment Dealers and Scrap Dealers will purchase usable pieces at good prices. These dealers can be located in the classified telephone book.

Decide right now to get going on this thing—and don't let anything delay you further. See to it that your own personal scrap record does not read . . . "TOO LITTLE AND TOO LATE!"

BUSINESS PRESS INDUSTRIAL SCRAP COMMITTEE

ROOM 3303, EMPIRE STATE BLDG., N. Y. C.

If you have done a successful salvage job at your plant, send details and pictures to this magazine.

SEND FOR THIS SCRAP MANUAL TO HELP YOU TACKLE THE SALVAGE RROBLEM

BUSINESS PRESS INDUSTRIAL SCRAP COMMITTEE
ROOM 3303, EMPIRE STATE BLDG., N. Y. C.

Please send scrap manual

Your name .....

Company name .....

Company address .....

ot its obligations. It won't be an easy job to meet our goal but I know it can be done with the full co-operation of all concerned. And I am satisfied, from the spirit manifested in the recent Washington conference, that we will receive this co-operation."

In broad outline, it will be Mr. Cummins' duty to review the Army's and Navy's Diesel engine requirements and allocate orders to fit plant capacities. Mr. Cummins first became associated with the Diesel engine industry during World War I when—functioning almost as a one-man plant—he built small "oil engines" for a mail order company. As the enterprise steadily expanded, he devoted his efforts to the building of a Diesel which would operate at higher speeds and thus deliver more horsepower per pound of engine weight.

In developing the modern Cummins Diesel, he attained this goal and made it possible for many industries—heavy-duty trucking to name one notable example—to capitalize on the inherently greater efficiency of the Diesel engine. Today, Cummins Diesel engines are performing almost every heavy-duty automotive, industrial, and marine service and the company which Mr. Cummins heads has doubled and redoubled in size many times. Even before the outbreak of the war, practically all production was earmarked for the National Defense Program and, since Pearl Harbor, plant capacity has increased still more to meet the demands of the armed services.

In this growth, Mr. Cummins has constantly remained an active participant and his broad experience covers not only field management but also those of engineering and production. For this reason he is considered exceptionally well qualified for the new job.

ESTABLISHED 1919
GUIBERSON
LESS THAN TONS PER HORSE POWER
AMERICA'S ONLY RADIAL AIR-COOLED DIESEL ENGINE
SAVE FUEL WITH GUIBERSON LIGHT WEIGHT DIESEL
POWER
IN TANKS • IN PLANES • IN SHIPS
The Guiberson with its amazingly simplified and efficient injection system uses only 26.2% as much fuel per hour as a gasoline engine of equivalent power. And every pound of fuel, although it costs only a fraction as much as high octane gasoline, gives 50% more power!
In planes, in tanks, and in light ships the extra power and extra range per pound of fuel of the Guiberson can spell the difference between reaching an objective or failure to complete a mission. For low-cost, dependable operation without fire hazard or radio interference, it's the Guiberson—America's only radial air-cooled diesel engine.
Guiberson U.S.A.
GUIBERSON DIESEL ENGINE COMPANY
DALLAS, TEXAS
THE GUIBERSON CORPORATION
AIRCRAFT AND HEATER DIVISION

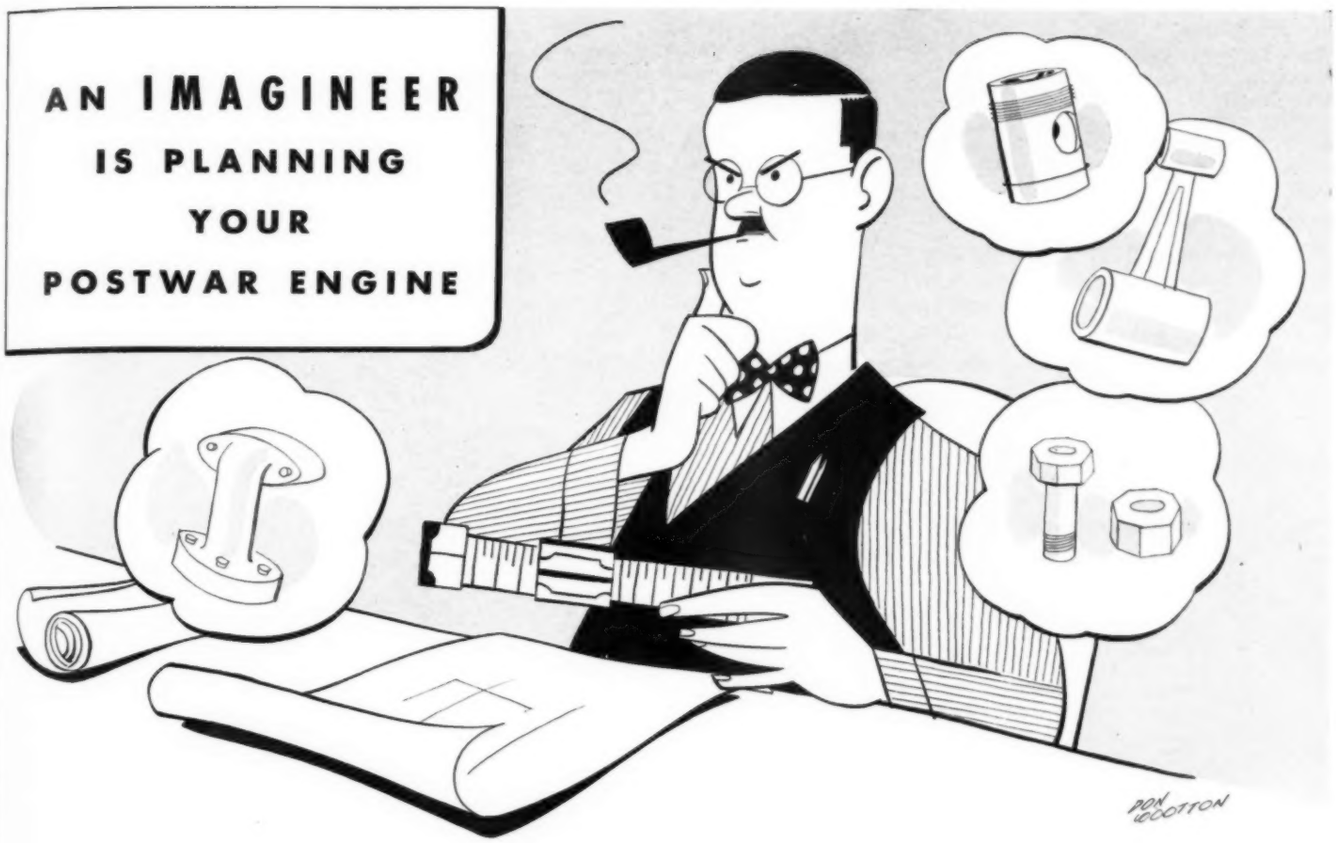
Advantages of Concentrated Cutting Bases

THE importance of buying concentrated cutting bases which can be mixed with blending oils in the user's plant is emphasized today to save shipping and storage space, drums, and shipping charges. E. F. Houghton & Co., who obtained the first patent on a cutting base in 1917, emphasizes the increased importance of the concentrated forms of the Cut-Max series, Refrigerant Base, and other brands used in drilling, rifling and reaming gun barrels, machining aluminum and magnesium, and for all types of machining and grinding operations. Blending oils, which can often be obtained locally, are added by the user as required. The saving in bulk is considerable, as the base represents from one-half to one-eighth of the total volume of the diluted oil.

Names Richardz Westinghouse Manager of Gear Engineering

FOLKE RICHARDZ, an engineer for seventeen years with the Westinghouse Electric and Manufacturing Company, has been appointed manager of engineering in the company's gearing department at the Nuttall Works, Pittsburgh, Pennsylvania. He succeeds S. L. Crawshaw, resigned.

Mr. Richardz was graduated in 1921 from the Institute of Technology in Katerineholm, Sweden, with a mechanical engineering degree. He joined Westinghouse in 1926 as a design engineer in the radio and photophone department at East Pittsburgh. In 1931, Mr. Richardz was assigned to the Nuttall Works as a design engineer, being appointed section engineer in the gearing department a year later.



Every engine manufacturer we know is up to his eyes in war work. If he's making Diesels, chances are he is using a lot of aluminum, because fighting equipment needs lightweight engines and it has to crowd a lot of power into a minimum of space.

Seeing what aluminum is accomplishing for the Army and Navy is bound to set those men thinking. So, in the eighth day they are able to squeeze into their seven-day work-weeks, they do some Imagineering. "Aluminum pistons and cylinder heads will let us speed up our engines; more horsepower per cubic foot of engine. Aluminum crankcases and cylinder blocks will cut down the weight of our engines."

And so it goes. Because of the fine performance that aluminum is turning in on prewar engines, and in fighting equipment, a better Diesel engine is in the making for you. ALUMINUM COMPANY OF AMERICA, 2141 Gulf Building, Pittsburgh, Pa.

ALCOA · ALUMINUM

Earl L. Young With Laminated Shim Twenty-two Years

LAMINATED Shim Company, Inc., Glenbrook, Connecticut, manufacturers of Laminum shims and shim stock and An-cor-lox self-locking nuts, announces the retirement of Earl L. Young, vice president in charge of production. Mr. Young has been with the company twenty-two years, since February 1, 1920, and has been in charge of production to the date of his retirement.

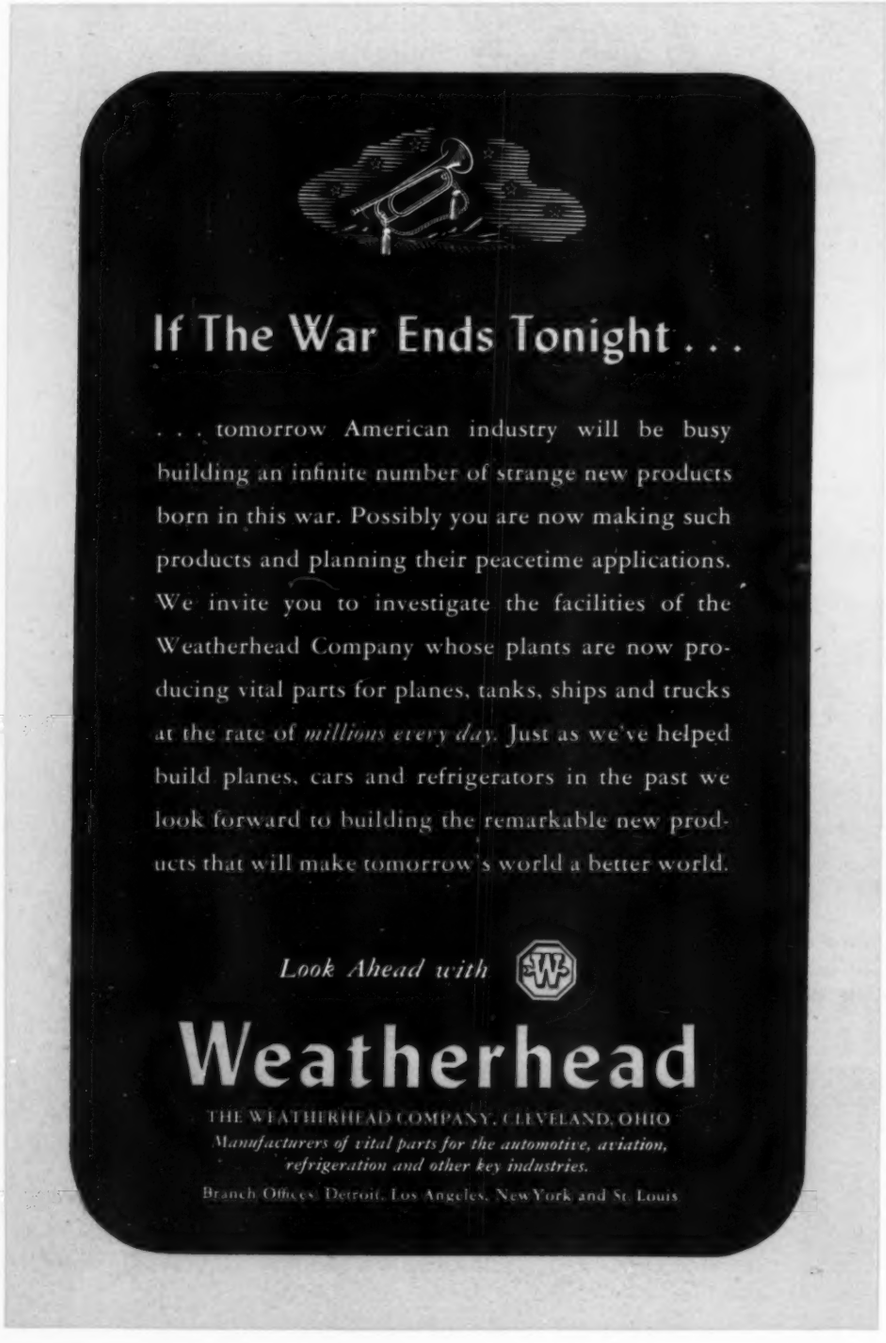
Automatic Temperature Control For Evaporative Heat Exchanger

A NEW method of automatic temperature control for the Niagara Aero Heat Exchanger as used for cooling industrial liquids is announced by the Niagara Blower Co., 6 E. 45th St., New York City.

This method is based on controlling the amount of outside air passed through the evaporative cooling chamber rather than altering the flow of liquid being cooled. Accuracy is improved, with the cooling effect directly proportioned to load changes, giving a modulated, nearly straight-line temperature control with no "hunting" action. Water savings are increased and when the heat exchanger is used to cool oils or compounds, there is no settling of solids, restricted flow or clogging of tubes to interrupt operations.

The apparatus comprises a recirculating air duct to which outside air is admitted by dampers controlled by a thermostat in the liquid line where it is always in contact with the full flow of the liquid being cooled. Only the minimum amount of outside air is admitted, keeping spray water temperature above freezing to prevent damage to equipment in cold weather. U. S. Patent No. 2,296,946 has been granted.

With this automatic temperature control the Niagara Aero Heat Exchanger is applied to cooling water, oils, solutions, compounds, coolants, chemicals and process materials in such varied fields as heat treat quenching, wire drawing, cutting, grinding and machining coolants; chemical process cooling, plastics, petroleum products; engine jacket water, air and gas compressor jackets, inter and after coolers; transformers and motor generators, electronic apparatus; condensers, bearings, moulds hydraulic equipment, process and power equipment. More accurate and effective cooling is obtained, water is saved and the use of refrigeration made unnecessary in many applications.


If The War Ends Tonight . . .
. . . tomorrow American industry will be busy building an infinite number of strange new products born in this war. Possibly you are now making such products and planning their peacetime applications. We invite you to investigate the facilities of the Weatherhead Company whose plants are now producing vital parts for planes, tanks, ships and trucks at the rate of millions every day. Just as we've helped build planes, cars and refrigerators in the past we look forward to building the remarkable new products that will make tomorrow's world a better world.
Look Ahead with
Weatherhead
THE WEATHERHEAD COMPANY, CLEVELAND, OHIO
Manufacturers of vital parts for the automotive, aviation, refrigeration and other key industries.
Branch Offices: Detroit, Los Angeles, New York and St. Louis

Interesting Caterpillar Booklet

THE title question, "How Are Caterpillar Diesels Serving and Saving?", is answered in an eight-page booklet just published by Caterpillar Tractor Co., Peoria, Illinois. Interesting sketches and photographs are used to illustrate the series of questions and answers. A copy of the booklet will be mailed upon request.

Iceland Gets Transit System—Four Mack Diesel Buses

JOHNNY DOUGHBOY is recognizing something from home in Iceland these days. That strategically located island has just received four Mack buses for use in its capital, Reykjavik. These are the first buses to appear on the island, which boasts a total of 2,000 passenger cars and trucks, mostly U. S. Army vehicles.

The four buses, according to Mack Company officials, were ordered last April and shipped in November. They are powered by Mack Diesel engines and are being operated by the Street Car Bus Company.

WHERE A WORK-WEEK IS

168 HOURS

EVERY DROP of diesel engine fuel oil is precious—for diesels don't rest—on the cargo lanes. Nor do men. A day is 24 hours. A week is 168.

But there's a promise in the eyes of those men. Burning eyes, deep-set in gray, dog-tired faces. A promise to Greece, and France, and Belgium . . .

There's a promise, too, in the steady chug of the diesels. A promise to keep pounding on, through the blue-white hell of the North Atlantic, with that brute power and ruggedness we build into them. A promise to furnish power, 168 hours a week. And another promise, too . . .

It's this: that tomorrow, our diesels will continue their 168-hour weeks, and serve more places than ever before. So that man-weeks can be shorter . . . power cheaper . . . work easier . . . transportation better and swifter than ever before.

And every man here is working, now, to see that Rogers products keep both promises. Rogers Diesel and Aircraft Corporation, 1120 Leggett Avenue, NewYork, N.Y. Divisions: Hill Diesel Engine Company, The Edwards Company, Edwards Aircraft Products, Inc., Ideal Power Lawnmower Company.

ROGERS DIESEL AND AIRCRAFT CORPORATION

R D A

TRADE MARK REG.

Diesel Engines, 5 to 2000 h.p. » Gasoline Engines » Generator Sets » Generators » Power Units » Switchboards » Pumping Units » Hydraulic Aircraft Equipment » Recoil Mechanisms » Power Mowers » Power Brushes » Snow Removal Equipment Streamlined deluxe Railway Motor Trains » Diesel Locomotives

W. S. Newell Appointed To Mack Board

APPOINTMENT of William S. Newell to the board of directors of Mack Trucks, Inc. has been announced by Louis G. Bissell, chairman of the Mack board. Mr. Newell is president of Todd-Bath Iron Shipbuilding Corp. and president of Bath Iron Works.

Along with his new appointment at the Mack company, Mr. Newell holds directorships in the Maine Central Railroad, Fay and Scott, Bath Savings Institution and the Union Mutual Life Insurance Co. He also is a trustee of Colby College and Webb Institute of Naval Architecture.

Mr. Newell has degrees from the Massachusetts Institute of Technology, Bowdoin College and Colby College. He is vice president of the American Society of Naval Architects and Marine Engineers, a member of the Institution of Naval Architects of Great Britain, North East Coast Institute of Shipbuilders and Engineers, American Society of Naval Engineers, American Committee of Lloyd's Register of Shipping, American Bureau of Shipping, New York Chamber of Commerce, Boston Chamber of Commerce and the New England Council. He was born in Albany, N. Y., May 31, 1878, and at present makes his residence in Bath, Me.

New Blackmer Pump With Removable Liner

AS a further step in the conservation of the critical materials from which rotary pumps are made, the Blackmer Pump Company, Grand Rapids, Michigan, has just announced the start of production on a rotary pump with an improved removable liner, according to information released by J. B. Trotman, General Sales Manager of the Company.

This improved pumping unit operates on the same "bucket design" (swinging vane) principle as all standard Blackmer pumps, but it is so constructed that, when wear finally affects the capacity of a pump, the old liner may be easily removed, and a new one set in place. The replacement operation involves only the removal of the pump heads, driving out the old liner and inserting a new one. Neither piping nor drive is disturbed, and normally the pump can be back in operation in half an hour. Due to the self-adjusting buckets, no fitting is necessary. This construction represents a definite improvement over present "lined pumps" in that the anchoring mechanism is simplified, the cam bore changed and the intake and discharge ports "stream-

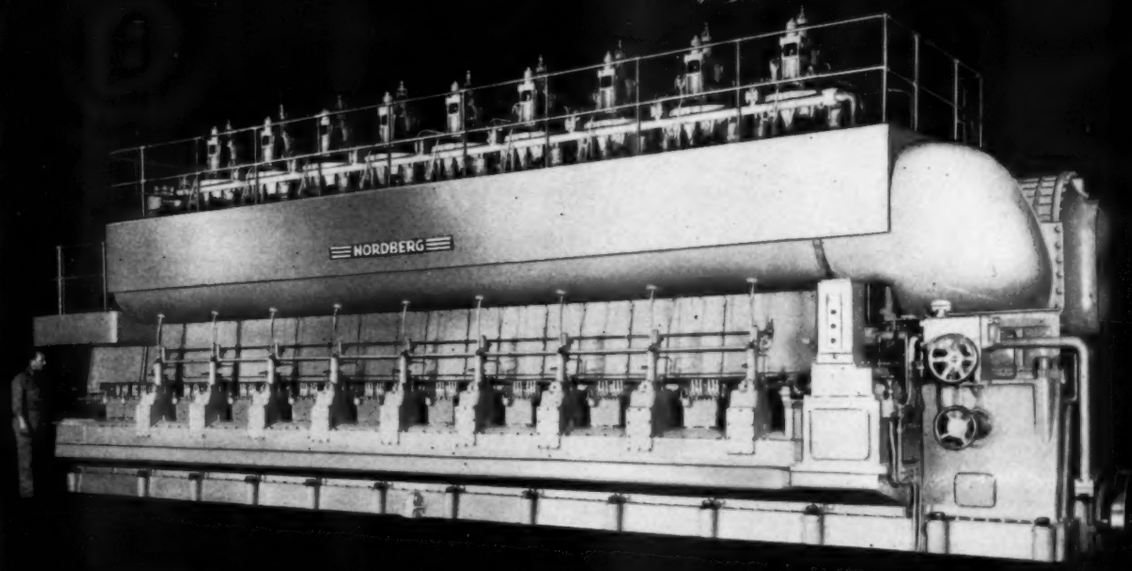
Dual Electrical RPM Indication ON THE SOHIOAN

WESTON *indicators are available in various sizes and shapes, with scales calibrated in any range of rpm.*

Distances, bulkheads nor decks present any installation problem when electrical RPM indication is used. Duplicate WESTON indicators are mounted in the pilothouse . . . *where they are needed to help insure peak operating efficiency* . . . and are simply wired to the engine mounted magneto, using existing conduit. This virtue of *easy installation* applies, too, whether the installation is single or dual; remote or close-by. Simple wiring is far easier to install than shafting and mechanical parts. And readings are inherently more dependable the electrical way . . . and more certain because of the instant, smooth pointer response to any speed fluctuation. Bulletin on WESTON Electrical Tachometers, is available on request. Weston Electrical Instrument Corporation, 579 Frelinghuysen Avenue, Newark, New Jersey.

WESTON *Instruments*

POWER FOR WAR



POWER FOR PEACE

We are proud to fly the Navy "E" with the added star signifying that excellence in production has been maintained.

In meeting today's conditions imposed by war, dependable power is more essential now than ever before. Here again Nordberg engines are demonstrating the advantages of dependable Diesel power just as they have during many years under peacetime conditions. Included among the many users of Nordberg Diesels serving the war effort are installations at vital air bases, at mines producing strategic metals such as aluminum, copper, lead and zinc, wartime chemicals, oil pipe lines and in industrial, public utility and municipal power plants serving every conceivable industry. Many of the fastest cargo and naval supply ships afloat are powered with Nordberg engines. In every power application you can depend on Nordberg Diesels for reliability and economy.

NORDBERG MFG. CO. • MILWAUKEE

Don't say DIESEL-
say NORDBERG

NORDBERG MACHINERY

NORDBERG
DIESEL ENGINES

NORDBERG MACHINERY

lined" to handle more viscous liquids and increase the volumetric efficiency of the pump. The quick replacement feature not only saves the cost and critical materials required for a new pump, but shortens the "down-time". It is especially important for pumps handling corrosive or mildly abrasive liquids, where pump life is normally very short.

Blackmer pumps with the improved removable liners are being made in capacities from 20 to 750 GPM and pressures up to 300 psi.

A "Blueprint" to Flexible Metal Hose For Ships

CHICAGO Metal Hose Corporation's new bulletin "Shipbuilding Series M-45" is just off the press. It contains twelve pages of up-to-date engineering data, illustrations and information on various types of Rex flexible metal hose; couplings; flanges, specifications and recommendations on various marine applications such as: starting air lines; air intake lines; lubricating oil lines; fuel lines; pressure gauge connectors; high pressure hose; exhaust lines; water lines; ventilating tubing; voice tubing. Engineers who are concerned with problems involving flexible connections will find this well-illustrated book extremely valuable. Published by Chicago Metal Hose Corporation, Maywood, Illinois.

Editorial Index Available

A COMPLETE editorial index of all issues of DIESEL PROGRESS published in 1942 has been prepared. The index is conveniently arranged by titles and subjects and is now available without charge upon written request. Address Diesel Progress, 2 West 45th St., New York, N. Y.

American Locomotive Company Wins First Medal Award for Advertising As a Social Force

FIRST medal award for the best use during 1942 of "Advertising as a Social Force" has been made to the current American Locomotive Company's advertising campaign which began last November.

The award was given to Kenyon & Eckhardt, Inc., who prepared the advertisements for the American Locomotive Company, at the Eighth Annual Advertising Awards dinner at the Waldorf-Astoria on Feb. 6. Walter Weir, who wrote the copy for the advertisements, was designated by Kenyon & Eckhardt to receive the award.

Citation of the company's 1942 advertising ranked it as the best example of advertising "employed educationally, such as for health, political science, national economics, the war effort, etc., or when employed for a product that tends toward bettering the standard of living."

The American Locomotive series, illustrated in four colors, has dealt with the possible consequence of a Nazi victory to the American people. When the advertising campaign was inaugurated, President Duncan W. Fraser said: "It has seemed to us that the time has come to enlist our advertising more completely in total war. We sense that it may no longer be appropriate for us to continue to report to the American public on our war production. The public already expects us to do all we can without talking too much about it.

"We have, therefore, decided to use our advertising to help bring home the significance of the war in terms of what it means to every individual American. It is our hope that in this way we may increase in some measure the disposition of the people to take, with even greater promptness and vigor, those actions which Government and other agencies are asking them to take for Victory."

Official U. S. Navy Photo.

Keeping the Engines Fit to Fight

Michiana Filters Keep the Oil Clean for Longer Service

• Where dependability of engine performance is vital, — the thoroughness of oil filtering is the most essential factor.

In supplying Oil Filters for gasoline and diesel engines for thousands of our fighting ships and other mechanized equipment, MICHIANA employees have recognized the importance of adhering strictly to specifications — as well as the need for "on-time" deliveries.

The greatly expanded experience gained in supplying our Armed Forces assures all engine users better MICHIANA Oil Filters than ever before.

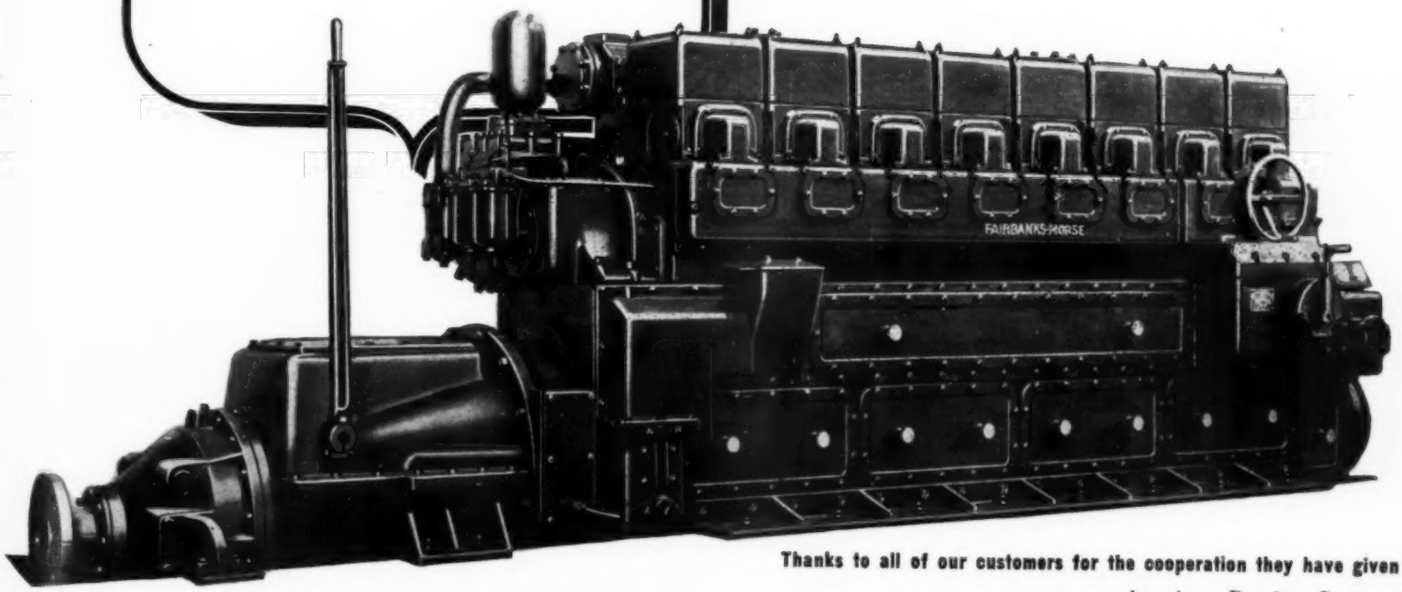
MICHIANA PRODUCTS CORPORATION,
Michigan City, Indiana

MICHIANA
OIL FILTERS

SELECTED BY THE LEADERS

SATCO* Bearings are recognized among the leading Diesel engine Builders as safe, dependable accessories to excellent design. Satco* metal meets exactly the requirements of modern Diesel operation — it withstands heavy pressures with great strength and yet with sufficient plasticity to achieve uniform distribution of load over the bearing area. The marine Diesel illustrated below is a product of one of the leaders using Satco* Bearings.

*Trade Mark Registered.



Thanks to all of our customers for the cooperation they have given us.

American Bearing Corporation
Peter Lambertus, Pres.

AMERICAN BEARING CORPORATION

INDIANAPOLIS — INDIANA

CENTRIFUGAL American Bearings FORCE

Simplified Checks Chart For Servicing Rotary Pumps

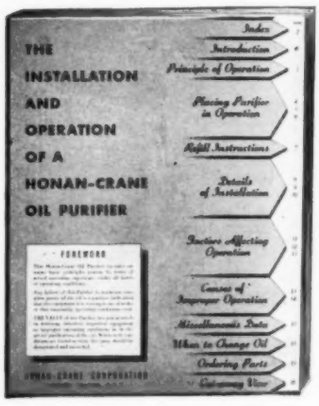
WITH the pressure of war production becoming daily more intense and the demands upon existing pumping equipment in all types of manufacturing plants becoming greater, the Blackmer Pump Company has reprinted a simplified check chart on the servicing of rotary pumps.

The chart is prepared in card form, punched at the top center, so that it may be hung on a pipe or wall near a pump installation, and serve as a constant reminder to the maintenance men.

The original printing of this card was made early in 1942 and many thousands of them were distributed to industrial plants in this country and Canada. There has been a recent increase in the demand for more of these cards and this renewed interest has prompted Blackmer Company to reprint the cards and again make them generally available to all industrial plants where rotary pumps are used. The cards will be mailed in any reasonable quantity upon request, addressed to Mr. J. E. Trotman, General Sales Manager, Blackmer Pump Company, Grand Rapids, Michigan. Form No. SER-1 should be specified in the request.

New Honan-Crane Oil Purifier Manual

THE new, 20-page manual, "The Installation and Operation of a Honan-Crane Oil Purifier" should be of great interest and value to any person interested in any kind of Oil Purification.



This manual, published by the Honan-Crane Corporation, covers the following subjects:

- Principle of Operation
- Placing Purifier in Operation
- Refill Instructions
- Details of Installation
- Factors Affecting Operation
- Causes of Improper Operation
- When to Change Oil
- Ordering Parts and Cut-away View

This booklet may be obtained by writing on your Company letterhead to: The Honan-Crane Corporation, 600 Wabash Avenue, Lebanon, Indiana.

Typographical Error

A LETTER from Ralph Hemphill to Henry Kaiser, reproduced in part in the December 1942, issue of DIESEL PROGRESS, stated that "Diesel engines now power . . . . the Navy PT boats." Packard Motor Car Company, builders of the famous engines which power PT boats, rightfully questioned the above statement and Ralph Hemphill, returning from an extended trip, hastened to explain that he had PC boats in mind as being powered with Diesels. Our apologies to Packard.

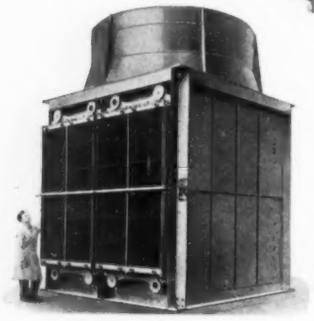
Supercharger Intercooler.

Combination Surge Tank, Engine Jacket Water and Lube Oil Heat Exchanger.

Marine Heat Exchanger For Engine Jacket Water and Lube Oil.

Young
HEAT TRANSFER UNITS

To diesel and gasoline engine manufacturers, the Young Radiator Company offers a specialized service . . . the ability to manufacture heat transfer equipment to meet particular needs. Pictured are some products of that service. Many manufacturers rely on YOUNG engineers to design their cooling equipment in its entirety. YOUNG engineers are well qualified to do a complete job, for back of them is a long and diversified experience with internal combustion engine cooling problems, and the complete facilities of a modern research and testing laboratory.



Quad Atmospheric Cooling Or Condensing Tower.

Young
MARINE HEATING AND COOLING UNITS

Young marine type heating units, ventilation equipment, and cooling or refrigeration coils are widely used on cargo vessels, warships and commercial craft.

For Army, Navy and Industrial heat transfer equipment to meet new demands of combat and operation, call on our engineers. We will build to the specifications you have to meet.

YOUNG RADIATOR COMPANY
Dept. 233D, Racine, Wisconsin, U. S. A.

Buy Bonds—Produce More—Salvage Scrap—Win the War

Young
HEAT TRANSFER PRODUCTS
OIL COOLERS · GAS, GASOLINE, DIESEL ENGINE COOLING RADIATORS · INTERCOOLERS · HEAT EXCHANGERS · ENGINE JACKET WATER COOLERS · UNIT HEATERS · CONVECTORS · CONDENSORS · EVAPORATORS · AIR CONDITIONING UNITS · HEATING COILS · COOLING COILS

Young SERVICE

Baptism of Fire

A Challenge to Men and Equipment

ArmaSteel*

On armored cars, trucks, tanks and other military equipment, ArmaSteel parts are meeting the challenge of combat usage. Applications range from Diesel pistons to rocker arms, and call for a wide variety of physical characteristics.

Yet the big story on ArmaSteel, substantiated in newspaper reports on war production, is the important savings in time and materials it has accomplished. ArmaSteel castings reduce machining time and tool wear . . . replace critical steels and alloys . . . and lend themselves to methods and practices which speed the manufacture of finished parts.

ArmaSteel deserves your consideration in the work you are now doing and in future operations.

SAGINAW MALLEABLE IRON DIVISION
General Motors Corporation, Saginaw, Michigan

*Reg. U. S. Pat. Off.

CAST FOR A LEADING ROLE IN INDUSTRY

Westinghouse Appoints Finnell

APPOINTMENT of Thomas C. Finnell as manager of the Industrial Department in the Eastern District of the Westinghouse Electric and Manufacturing Company was announced recently by James Boyd, Eastern District Manager of the company.

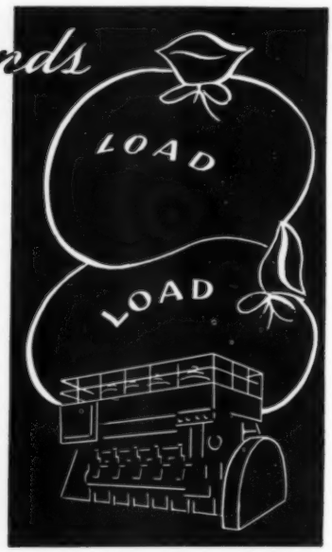
Mr. Finnell succeeds C. W. Miller, who was named Manager of the Application Department of the Westinghouse Radio Division at Baltimore. In his new post, Mr. Finnell will supervise the supplying of electrical equipment to war industries throughout New York State and northern New Jersey.

Mr. Finnell joined Wesinghouse in 1929 when he entered the company's graduate student course at East Pittsburgh. He was assigned to New York in 1931, where he served as an application engineer until his newest appointment. Born in St. Paul, Minnesota, October 10, 1905, Mr. Finnell attended Central High School there and the University of Minnesota in Minneapolis where he received a Bachelor of Science degree in Electrical Engineering in 1929.

TODAY'S *Demands*

LOAD DIESEL POWER TO LIMIT

Production schedules on the dot! Transportation speeded to new records! Protect Diesel Engines and driven units against misalignment—whip, backlash, overload, drag, etc., by NON-LUBRICATED



L-R FLEXIBLE COUPLINGS

Send For Complete Catalog

Type "W" Pat. & Pats. Pend.
For Diesel Engines with stub shafts, or power takeoffs. Bores 1½" to 16¾". 2 to 2500 h.p. Load Cushions in sight.
L-R Type "WF" Pat. & Pats. Pend.
Bolts directly to Flywheel, clutch or drum. Saves space up to 1/3. Same h.p as Type "W". NO SHUT-DOWNS for cushion change.

FREE SELECTOR CHARTS COME WITH CATALOG

Anyone can select just the right L-R Coupling for the duty. Wire or write for L-R Flexible Coupling Catalog.

LOVEJOY FLEXIBLE COUPLING CO.

4930 WEST LAKE STREET
CHICAGO, ILLINOIS

A Token of Long and Outstanding Service

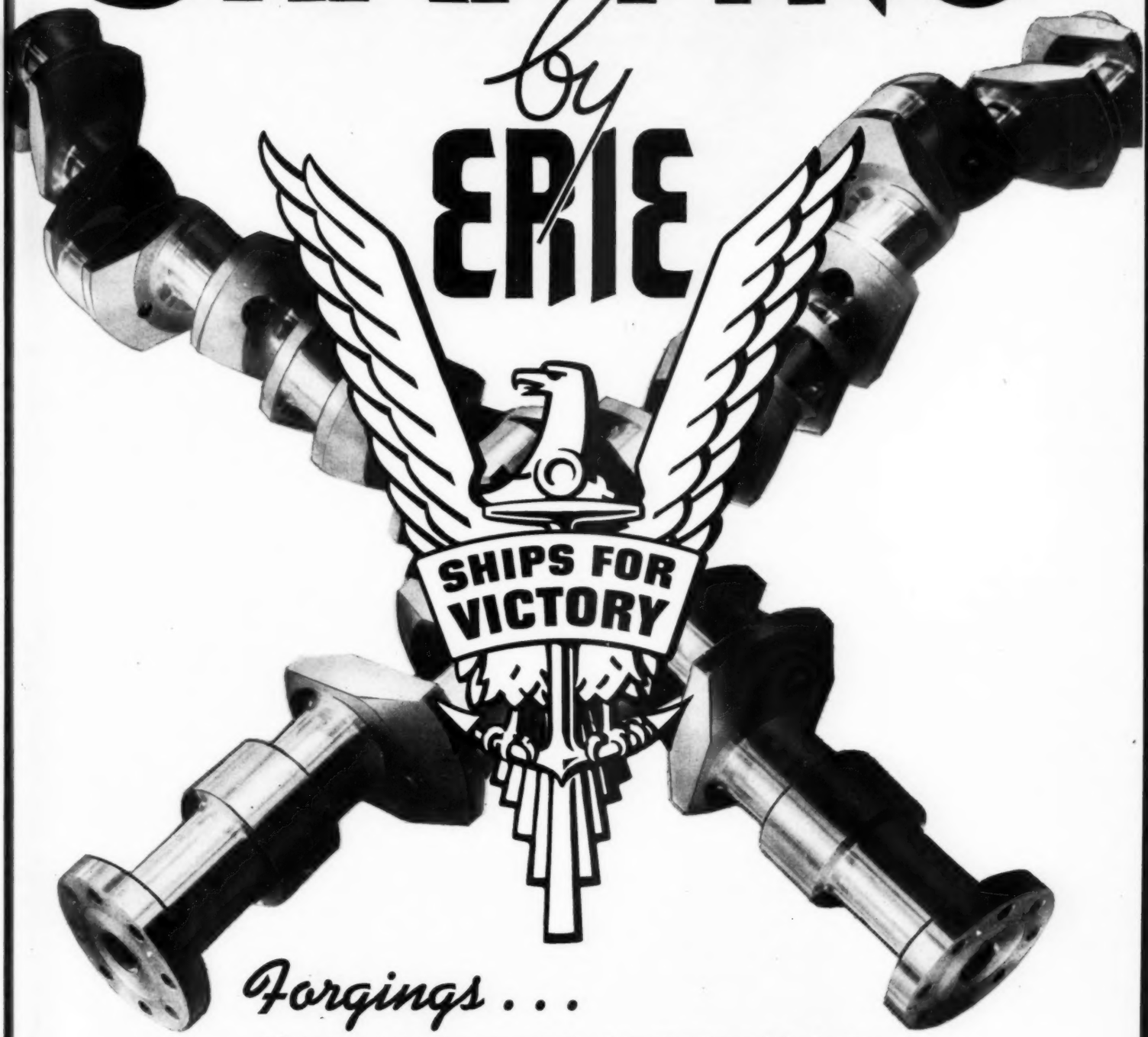
THIS handsome tray was presented to Henry R. Sutphen, executive vice president of the Electric Boat Company, by the executive committee of the National Association of Engine and Boat Manufacturers at a testimonial dinner held in the Union League Club, New York City, Thursday, March 11. The occasion was the honoring of Mr. Sutphen's fiftieth year of boat building, and his twenty-fifth year as president of the National Association. In the absence of George W. Codrington, head of General Motors' Cleveland Diesel Engine Division and first vice president of the Association, the tray was presented to Mr. Sutphen by Ralph G. Klieforth, President of the Universal Motor Company, as a token of the esteem and affection in which Mr. Sutphen is held by his colleagues. The memento is an outstanding example of the silversmith's and engraver's art. The tray, of solid silver, comes from the shop of Thomas Bradbury of Sheffield, one of England's famous silversmiths. On its surface is engraved a PT boat, the work of George DeVind, veteran master engraver of Black, Starr and Gorham. On the bow of the boat, the inscription, PT 50, is countersunk in gold, as are the numerals 1892-1942, commemorating Mr. Sutphen's golden jubilee in the boat building business. Facsimile signatures of the officers and directors of the National Association also are engraved on the surface of the tray.

Haering Announces Forty-Eight Page Booklet on Water

D. W. HAERING & Co., Inc., 205 West Wacker Drive, Chicago, Illinois, water treatment consultants, has just published a forty-eight page booklet of articles on scale, corrosion and water treatment problems reprinted from a selection of the most interesting and popular discussions to appear in the company's well known house organ, H-O-H LIGHTHOUSE.

Profusely illustrated, the booklet provides important information including tables, charts and graphs on water problems occurring in

SHAFTING *by* ERIE

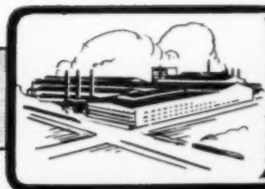


Forgings . . .

• By the Erie Forge Company, finished for Diesel Crankshafts, Line Shafts and other forged parts, are driving the Nation's Ships for Victory . . . Forgings and Steel Castings are produced at Erie Forge Company under One Responsibility and with One Control . . . You can depend upon the Quality and Service which this complete control, from raw material to finished product, accords your requirements when you place them with us.

ERIE FORGE COMPANY, ERIE, PA.

★ ★ ★ ★ ★ ★ ★ ★ ★



cooling systems, hot water systems, boilers, and return systems including special data on corrosion inhibitors, scale preventives, protective coatings, proportioning equipment and refrigerating brine problems.

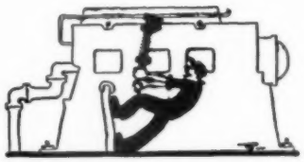
Provided in a convenient pocket size, the new H-O-H WATER STUDIES catalog is being distributed by D. W. Haering & Co., Inc. without expense or obligation to chemists and engineers addressing requests to the company on letterheads or indicating the nature of their interest in water.

Name A. N. Morton Mack Production Chief

APPOINTMENT of A. N. Morton as production manager of the Mack company's three huge plants has been announced by Charles T. Ruhf, president of Mack Manufacturing Corp. and executive vice president of the parent company, Mack Trucks, Inc.

Mr. Morton, formerly factory manager of the Plainfield, N. J., plant, in his capacity of production manager, will extend his duties to the New Brunswick, N. J., and Allentown, Pa., plants as well. In taking over his new position, Mr. Morton follows Mr. Ruhf who had been operating vice president in charge of the factories before assuming the presidency. The three plants he will manage have all received the coveted Army-Navy "E" for excellence in war production.

U. S. NAVY SUBMARINE — SALMON
Safeguarding
THE SEA LANES
THE DIESELS
DIRECT—READING
PREMAX
ENGINE PRESSURE INDICATOR
Submarines are the sleek sabers of the United States Navy. Striking swiftly, silently and with deadly effect, they attack the enemy wherever he is met so that the highways and byways of the seven seas may be made safer for the fleet of freedom.
Every safeguard is employed by the Navy to maintain the sharp edge of efficiency of its underseas fleet. The direct-reading PREMAX Indicator is used to check the firing and compression pressures of the Diesel engines—for maintenance of proper pressures is assurance of peak power output, maximum fuel economy, and protection against sudden breakdowns.
The simplified PREMAX is ideally suited for service on submarines -- rugged, durable; requires no skill, scale measurements, or calculations. It is easily attachable to any Diesel and is in widespread use in the stationary and automotive fields where it is helping to maintain the same dependable Diesel performance required by the United States Navy.
USE PREMAX SAVE FUEL PROTECT PRECISION PARTS
BACHARACH INDUSTRIAL INSTRUMENT CO.
7000 BENNETT STREET · PITTSBURGH, PA.



First Gold Star Added to General Machinery's Wartime "M" Pennant

AWARD of its first gold star, to be added to the Maritime "M" pennant won last July, has been made to General Machinery Corporation, Hamilton, Ohio. Notification of the honor for "continued outstanding production," was sent to General Machinery Corporation, by Admiral H. L. Vickery, Commissioner, U. S. Maritime Commission, in the following telegram from Washington, Feb. 20—

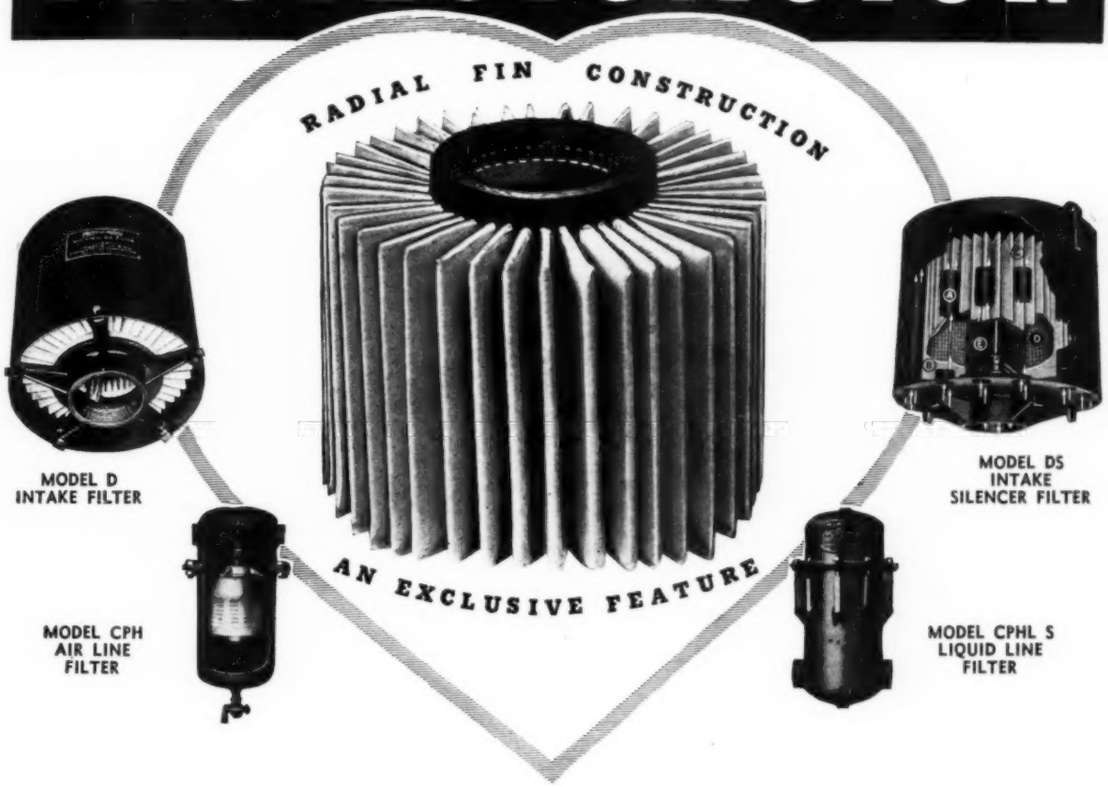
"As Chairman of the United States Maritime Commission Board of Awards I take pleasure in advising you that the Board in recognition of continued outstanding production achievement has awarded your company its first gold star to be added to your 'M' Pennant. H. L. Vickery, Commissioner, U. S. Maritime Commission."

General Machinery Corporation embraces The Niles Tool Works Company, The Hooven, Owens, Rentschler Company, of Hamilton, and The General Machinery Ordnance Corporation of Charleston, W. Virginia. These companies are producing heavy machine tools, steam and Diesel engines, cannon and gun barrels.

The gold star award is the fourth national recognition of the production efficiency of the General Machinery Corporation. It was the first industrial organization to be awarded the Maritime "M" Burgee; in August and September, 1942, two of its units received Army & Navy "E's".

There was no public observance of the gold star honor. "We value beyond estimate, and shall display and treasure the award, which was hard to win, but we're too busy on the job now take time off for ceremonies," company officials commented.

THE HEART OF EVERY PROTECTOMOTOR



RADIAL FIN CONSTRUCTION—an exclusive, patented feature found *only in Protectomotor* Air Filters for intake on engines and compressors and for pipe line filtration—has two major advantages: **FIRST**, it possesses a large area of filtering surface in relation to the overall size of the insert. An insert in the Radial Fin Construction only 11" high x 8¼" in diameter has an active filtering surface area of 1325 sq. inches! This means low resistance to air flow, high efficiency and long, maintenance-free life.

SECOND, the Radial Fin Construction is the best form ever devised to resist pulsating intake. It has no broad, flat surfaces to break down under the destructive pulsation of a hard-driven internal combustion engine or compressor. Each rigid, wire mesh framed fin opposes an *arch* to the force of inrushing air. Write today for the latest catalog describing Protectomotors in detail. Mention special interests. *Filters also made for ventilation and dust recovery.*

STAYNEW FILTER CORP. "Air Filter Headquarters"

12 Centre Park — PROTECTOMOTOR AIR FILTERS — Rochester, N. Y.

Executive Appointments Accelerate Production at Enterprise

WHILE Enterprise Engine & Foundry Company, San Francisco, has maintained a steady increase in engine deliveries month after month during the last year and a half, a more aggressive production program is now being initiated. Charles G. Cox, vice president has been appointed General Manager of the Diesel Engine and Manufacturing Divisions, and Serge P. Kovaleff placed in charge of Plant Production. Both of these men have long been identified with the growth and progress of Enterprise organization.

Mr. Cox, with a wide engineering background augmented by basic training obtained through diversified experience on various types of commercial and government craft, has for a period of years participated in all phases of the Enterprise manufacturing program. Under his guidance, the Engine and Manufacturing Divisions have been substantially developed and he has been directly responsible for the expeditious completion of Army, Navy and Maritime contracts essential to the defense and the offense of the United Nations.

Charles G. Cox

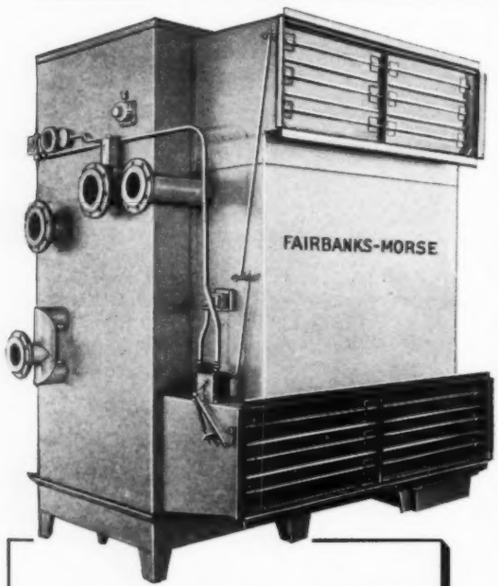
Mr. Cox has been prominently identified in the development and advancement of supercharging and turbocharging, and through his leadership many advanced engineering principles of design are now successfully being incorporated in modern Enterprise Diesel engines.

Serge P. Kovaleff

Mr. Kovaleff is a graduate of the University of California in the College of Electrical and Mechanical Engineering and has been continuously associated in an engineering and admin

No Time for Hot-tempered Diesels

KEEP 'EM "COOLHEADED" WITH F-M JACKET WATER COOLER—



SURE it takes heat to operate a Diesel—it's a *heat engine.* But too much heat is something else! For top efficiency, keep jacket water and lubricating oil at the ideal temperature with a Fairbanks-Morse Evaporative Cooler built specifically for this job. It will save fuel oil . . . keep water jacket passages free from scale and dirt . . . and insure the kind of engine cooling which minimizes down time for servicing. The right operating temperature reduces wear on *every part* of a Diesel.

The F-M Evaporative Cooler needs practically no attention and requires very little space. It can be placed in the engine room to eliminate danger of freeze-ups. Operating cost is low—about 2 pounds of water per 1000 B.T.U. of engine heat absorbed.

Write for This Bulletin

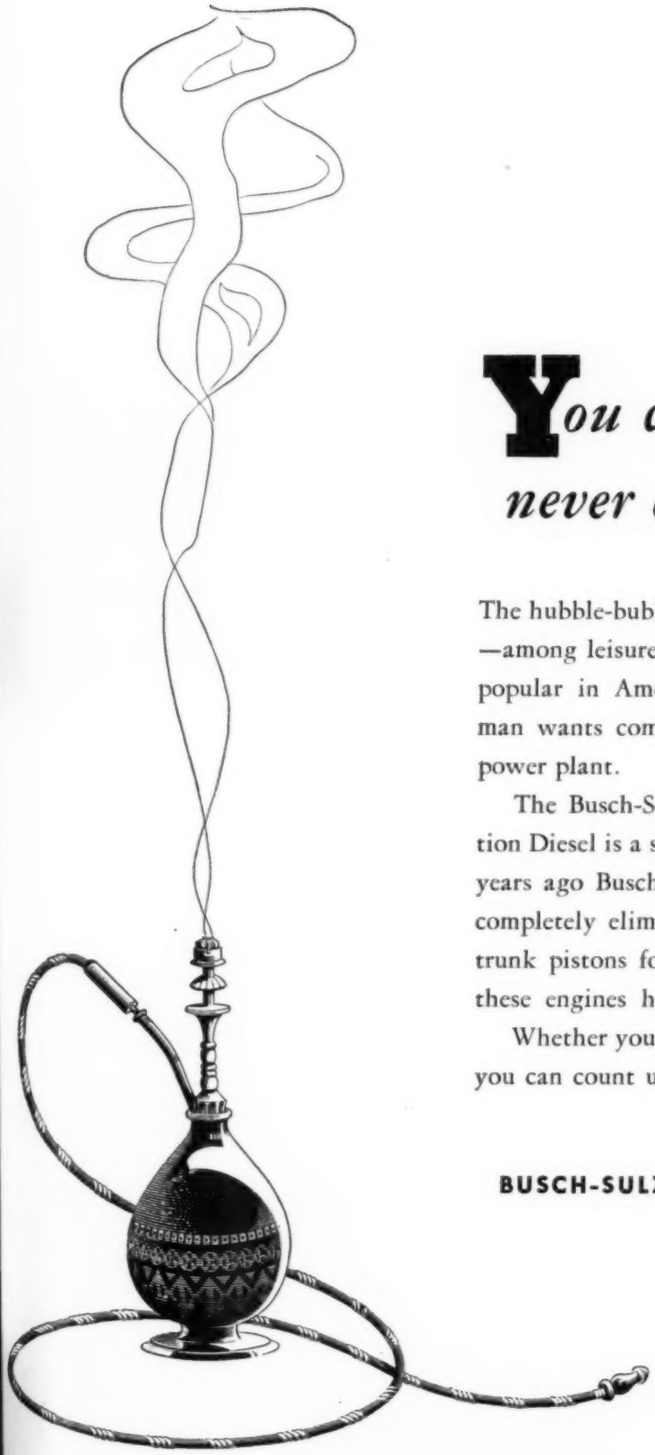
Bulletin FECD-2 tells the complete story . . . includes capacity tables, dimension drawings, piping diagrams, etc. Write for your free copy. Fairbanks, Morse & Co., Dept. B24, 600 S. Michigan Ave., Chicago, Illinois.

F-M EVAPORATIVE COOLER

Type C, with full thermostatic control. Lube oil temperature is controlled independently of jacket water temperature. Other types provide for semiautomatic and for manual control.

FAIRBANKS-MORSE & CO.

Air Conditioning Division F-M *Chicago*



You can see why this pipe never caught on in the U. S.

The hubble-bubble has made many millions of contented smokers —among leisurely Asiatics. One word tells what it lacked to be popular in America—simplicity. In this fast-moving land, no man wants complications, either in his pipe, his plans or his power plant.

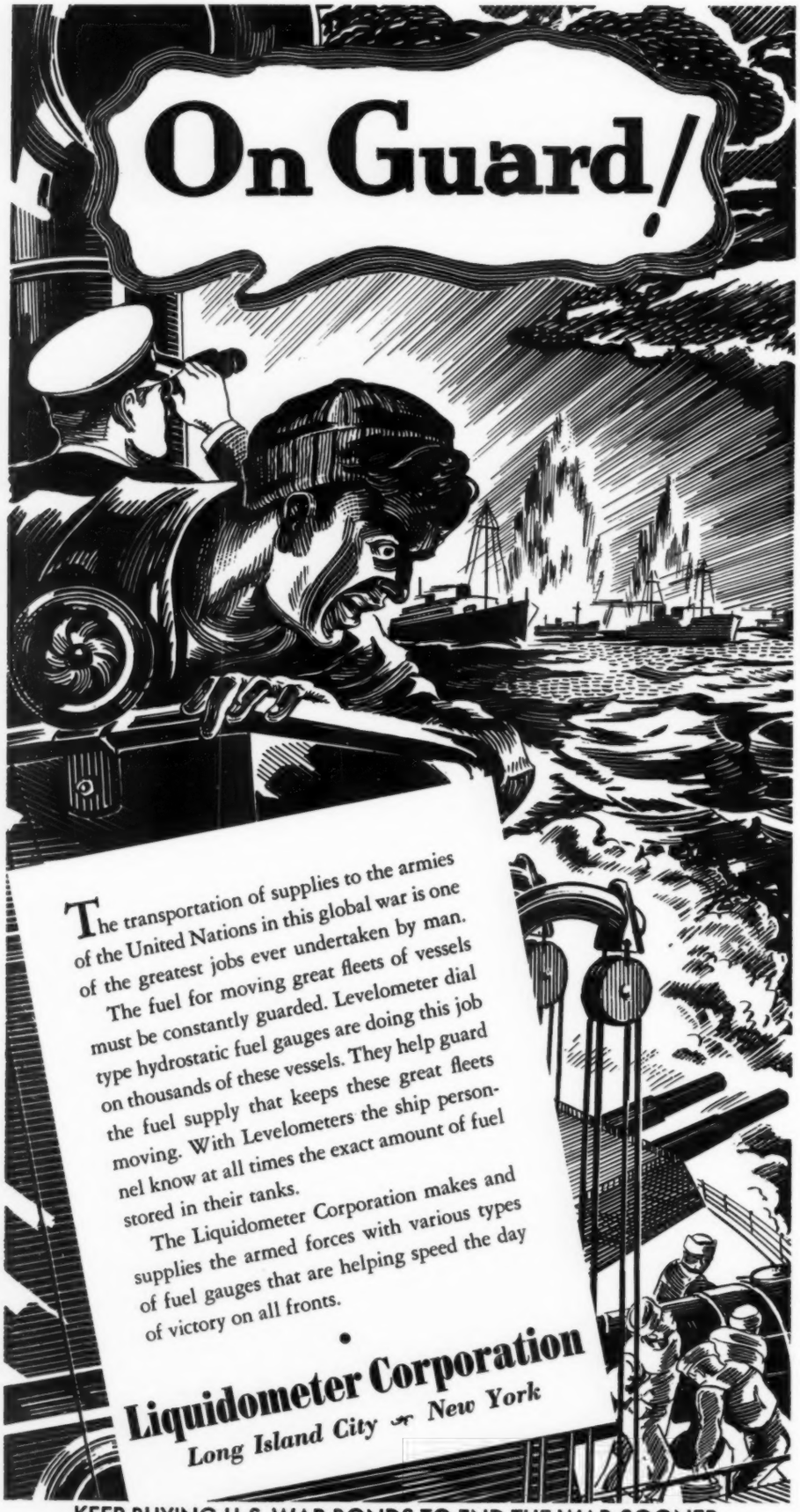
The Busch-Sulzer two-cycle, trunk piston, mechanical injection Diesel is a shining example of progress in simplicity. Twelve years ago Busch-Sulzer introduced startling innovations, which completely eliminated objectionable features of earlier types of trunk pistons for larger two-cycle engines. The performance of these engines has proved the soundness of this improvement.

Whether your requirements are of marine or stationary nature, you can count upon a Busch-Sulzer for reliability and long life.

BUSCH-SULZER BROS.-DIESEL ENGINE COMPANY
ST. LOUIS, MO.

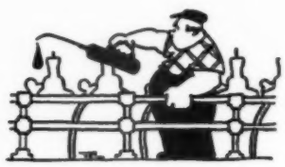
AMERICA'S OLDEST BUILDER OF DIESEL ENGINES

BUSCH-SULZER ST. LOUIS


On Guard!
The transportation of supplies to the armies of the United Nations in this global war is one of the greatest jobs ever undertaken by man.
The fuel for moving great fleets of vessels must be constantly guarded. Levelometer dial type hydrostatic fuel gauges are doing this job on thousands of these vessels. They help guard the fuel supply that keeps these great fleets moving. With Levelometers the ship personnel know at all times the exact amount of fuel stored in their tanks.
The Liquidometer Corporation makes and supplies the armed forces with various types of fuel gauges that are helping speed the day of victory on all fronts.
Liquidometer Corporation
Long Island City New York
KEEP BUYING U.S. WAR BONDS TO END THE WAR SOONER

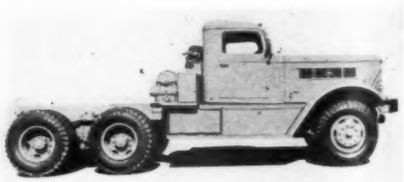
istrative capacity with the Enterprise company for the past seventeen years. Entering the company in 1926 as Plant Engineer, Mr. Kovaleff has held many positions of trust including management of the Process Machinery Division. In 1940 he was advanced to Plant Manager of the South San Francisco plant where he ably tripled production operations of iron, steel and non-ferrous castings, as well as expanding the pattern and machine shop facilities to meet the increased war demands.

Mr. Kovaleff's new duties as Production Manager places him in charge of production planning, control and scheduling of the engine division. He has been constant in his research activities in mechanical engineering, physics and thermodynamics and has actively participated in the Diesel engine development of the Company. His ability to obtain cheerful and willing cooperation from the men under him has resulted in accomplishing production schedules as planned in a most efficient manner and identifies him as a distinct leader in the Enterprise organization.

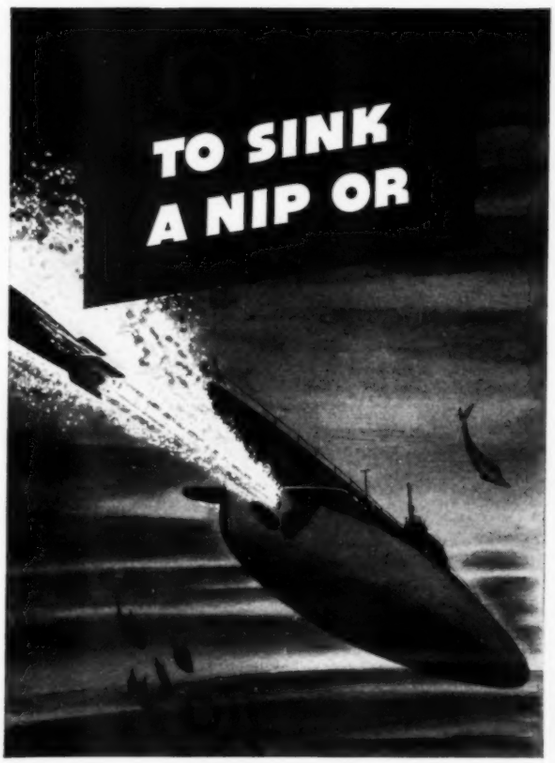


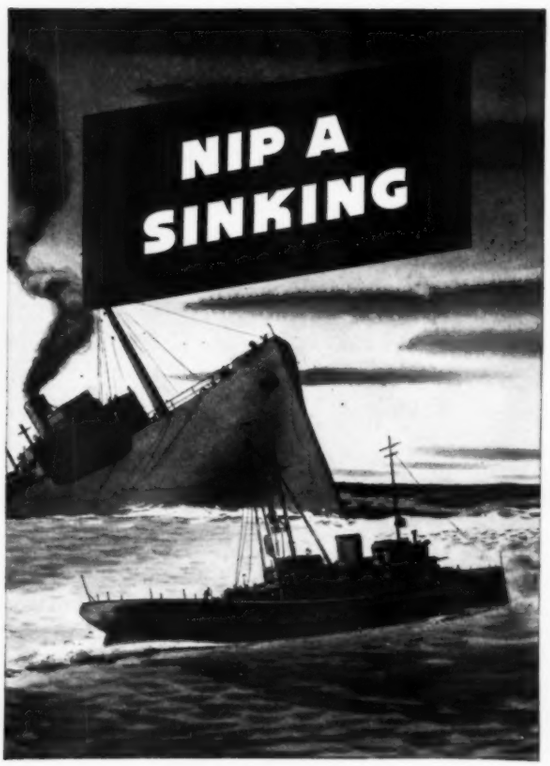
Reo Supplies Army Diesel Trucks for Tank Transportation

DELIVERY to the U. S. Army of a train load of special Reo-built, ten-wheel tractor-truck chassis as part of a large order for tank transportation units on which Reo production lines have been active for several months, is announced by Don C. Streeter, general sales manager, Reo Motors, Inc.



These Diesel units are used to transport tanks to points needed on battle fronts, thus saving these important fighting units from traveling long distances under their own power. The tractor-truck unit pulls a large flat-bed trailer on which tanks are loaded by means of power hoisting mechanism.





...the Navy uses RPM DELO!

The men who fight in U. S. Navy submarines believe that Japan is entitled to half the Pacific—the bottom half! That's where they're sending thousands of tons of enemy shipping.

But this isn't a one-way war. Many of our ships have been damaged, too—and would have sunk except for rescue by one of the Navy's ocean-going tugs. These sturdy ships are vital units of the Fleet, constantly on the alert to hold down our losses by towing crippled ships to bases where they may be repaired to fight again.

Submarines and tugs of the Navy both use RPM DELO to lubricate their powerful Diesel engines. So do other types of Navy craft. Day in and day out, RPM DELO in Navy Diesels is meeting and beating some of the toughest lubricating problems in history.

In *your* Diesels, too, RPM DELO will give dependable protection, freedom from ring-sticking and sludge trouble. No other oil combines its anti-oxidant, cleaning and non-corrosive properties. Switch now to RPM DELO.

STANDARD OIL COMPANY OF CALIFORNIA

RPM DELO
DIESEL ENGINE LUBRICATING OIL

ORDER RPM DELO FOR YOUR DIESELS

RPM DELO is marketed under the following names:
RPM DELO • Caltex RPM DELO • Kyso RPM DELO
Signal RPM DELO • Imperial-RPM DELO • Sohio RPM DELO
CONCENTRATE
Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your vicinity

John G. Barry, G. E. Honorary Vice President Dies

JOHN G. BARRY, honorary vice president of the General Electric Company, died at his home in Schenectady, March 4, after a long illness. He was 75 years old.

Mr. Barry had retired as senior vice president of the company July 1, 1935 after more than 45 years' service, and was elected an honorary vice president. His entry into the electrical industry was as an apprentice and test man with the Thomson-Houston Company, a predecessor of General Electric, in 1885 at Lynn, Massachusetts.

Born in Boston in 1868, Mr. Barry was educated in the public schools, and was graduated from Boston High School in 1885. Completing his apprentice training in 1890, he was assigned to the construction department of Thomson-Houston, later going to the company's Boston office.

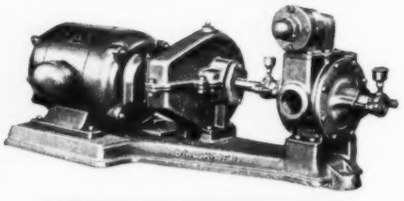
In 1892, when the General Electric Company was formed, he became a member of the railway department, which at that time was one of the company's two main divisions. The lighting department was the other. Sales work held a particular appeal for Mr. Barry, and existing opportunities in the electric railway field enabled him to do pioneer work. From Boston he went to New York, and then to Schenectady, where in 1897, three years after his arrival, he was made assistant manager of the railway department. The home office of the company had been established at Schenectady in 1894.

John G. Barry

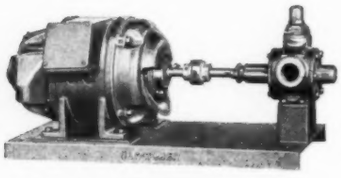
Mr. Barry's understanding of the difficulties in his chosen field and his ability to solve them led to his appointment in 1907 as manager of the railway department, in which position he proceeded to exert a marked influence on many aspects of the company's sales problems and policies. Widely known among railway executives and public utility officials, he became a conspicuous figure in the development of the American street railway business, and for many years was a member of the executive committee of the American Electric Railway Association. His notable success in developing the department resulted in his appointment as general sales manager in 1917, while still retaining the managership of the railway department. Finally, in June, 1922, he received the further distinction of being advanced to a vice-presidency, a move that was labeled by the industry "one of the most popular appointments of recent years." At this time, in association with Jesse R. Lovejoy, he had supervision of general sales in the apparatus field, and was succeeded as manager of the railway department by E. P. Waller.

"A DIESEL INSTALLATION— IS NO BETTER THAN IT'S PUMPS"

These BLACKMER ROTARIES have a 40 YEAR RECORD for DEPENDABILITY



REDUCTION GEARED PUMPS
20 to 750 GPM—Pressures to 300 psi.



DIRECT CONNECTED PUMPS
5-10-20 GPM—Pressures to 100 psi.

ROTARY HAND PUMPS
7 to 25 GPM—54 models.

Used for fuel and lube oil service on diesel installations—marine—stationary—transport.

Blackmer Nationwide Pump Engineering Service is at your call on all problems involving rotary pump applications.

YOU CAN BE SURE IF YOU SPECIFY BLACKMER PUMPS "BUCKET DESIGN" SELF-ADJUSTING FOR WEAR

Your "pump file" is not complete without this 24 page book.

MAIL THE COUPON NOW

BLACKMER PUMP COMPANY
1964 Century Avenue, Grand Rapids, Michigan

Send the literature checked.

☐ 24 page General Catalog #130 (Illustrated at left)
☐ Bulletin No. 301—Facts about Rotary Pumps
☐ Bulletin No. 120—Marine Pumps

Signed .....

Company .....

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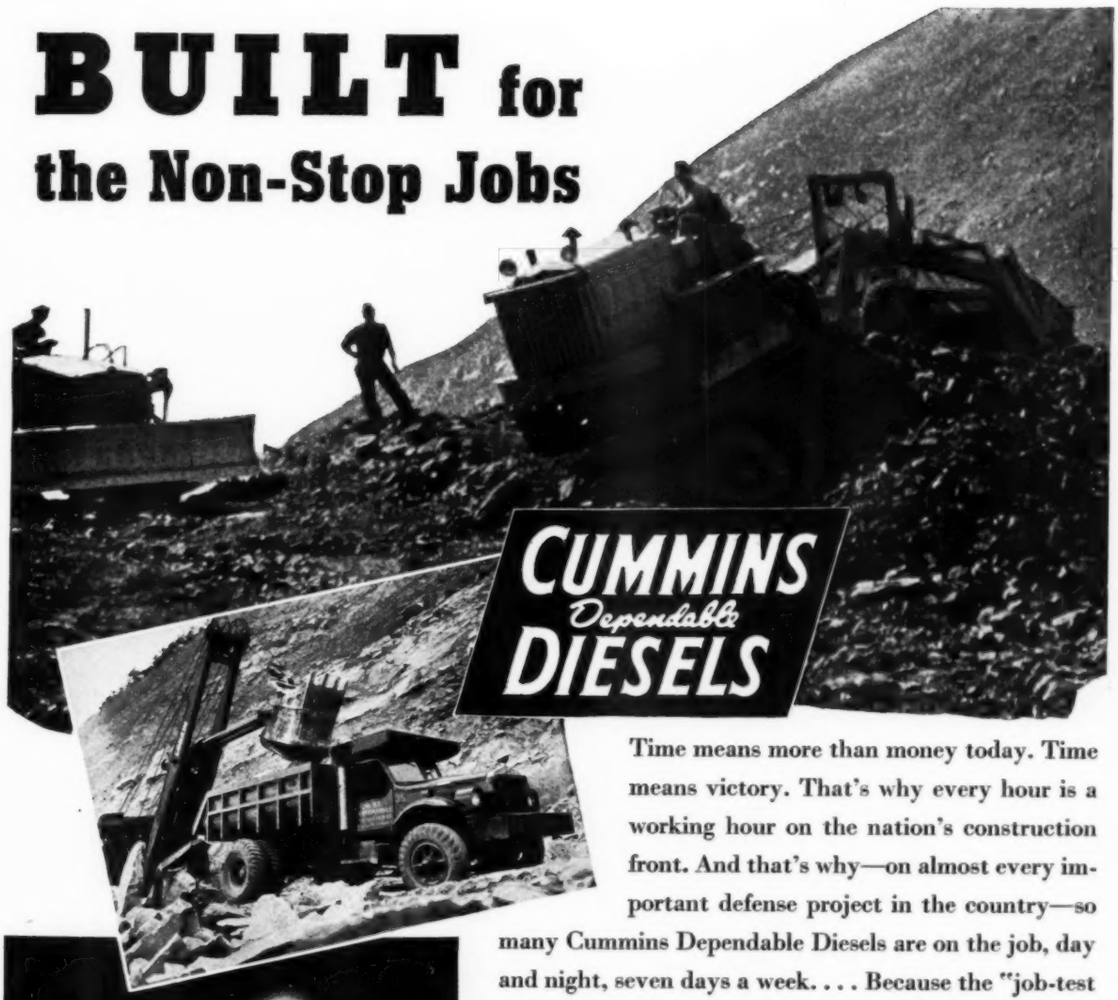
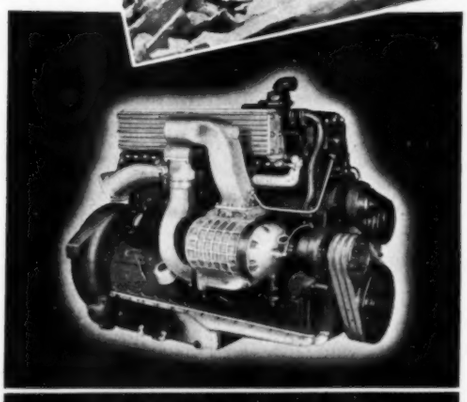
BUILT for the Non-Stop Jobs



Time means more than money today. Time means victory. That's why every hour is a working hour on the nation's construction front. And that's why—on almost every important defense project in the country—so many Cummins Dependable Diesels are on the job, day and night, seven days a week. . . . Because the "job-test evidence" has proved to leading contractors everywhere that there's no end to the Cummins Diesel's endurance . . . no limit to its ability to deliver full-rated power on a round-the-clock schedule in every heavy-duty service.

Assure uninterrupted operation on your job during the emergency by providing adequate maintenance and service for your Cummins Diesels. Take advantage of the complete parts and service facilities offered by authorized Cummins Dealers in all parts of the country.



Above: Model HBIS-600 (supercharged) Cummins Dependable Diesel. 200 hp. at 1800 rpm. There's no need to sacrifice more weight and space for extra power . . . supercharging gives you the additional horsepower needed in the same dimensions and with very few changes in your service parts requirements.

ILLUSTRATED AT TOP: *A supercharged Cummins Dependable Diesel powers this Cletrac FDLC tractor with 23-yard Wooldridge Scraper.*

LEFT, ABOVE: *One of the fleet of Cummins Diesel-powered trucks owned by the S. T. Brotemarkle Construction Co.*

CUMMINS ENGINE COMPANY • • • COLUMBUS, INDIANA

In July, 1928, Mr. Lovejoy was appointed an honorary vice president and retired from active duty, leaving Mr. Barry sole executive head of apparatus sales efforts.

Mr. Barry had made his home in Schenectady for more than 40 years, and had played an active role in civic affairs, serving as a member of the Board of Education and as Fuel Administrator for the district during World War I. He was a director of the Schenectady Savings Bank, the Schenectady Trust Company, and a veteran member of the Chamber of Commerce. He was a member of the Engineers, Railroad, Bankers, and Lotus Clubs in New York, and of the American Institute of Electrical Engineers.

Outstanding Globe performance in the toughest job a battery ever had — WARTIME REPLACEMENT SERVICE — explains today's rapidly growing use of GLOBE SPINNING POWER for Diesel-starting.

This important advantage — *powered to meet the extra demands of replacement service* — gives Globe Spinning Power the preference for all uses of modern Diesel equipment.

Let a Globe engineer study your requirements and furnish recommendation. Address nearest factory.

GLOBE-UNION INC. • MILWAUKEE, WISCONSIN

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DP-443

George W. Codrington New Head of National Association of Engine and Boat Manufacturers

TWO men, widely known in the boating field as well as leading figures in America's war production effort, exchanged posts as heads of the National Association of Engine and Boat Manufacturers on Friday, March 12. George W. Codrington, vice president of General Motors in charge of the Cleveland Diesel Engine Division, became the new president at the annual luncheon-meeting of the organization at the Hotel Commodore. In succeeding Henry R. Sutphen, executive vice president of the Electric Boat Company, Mr. Codrington became the third head of the National Association since 1904, when the organization was founded.

Mr. Sutphen, who now becomes first vice president of the organization, a post formerly held by Mr. Codrington, has been head of the National Association of Engine and Boat Manufacturers since 1918. He succeeded the late John J. Amory, former president of the Gas Engine and Power Company and Charles L. Seabury Company, Cons., now known as the Consolidated Shipbuilding Corporation. Mr. Amory, as the original president of the National Association, assumed that office in 1904 when this trade group was formed.

Mr. Sutphen is widely known as the man chiefly responsible for the development of the Navy's famous PT boats at the company's Elco plant in Bayonne, N. J. His company also is engaged in a huge program of submarine building at New London, Conn.

Mr. Codrington, the new president, as head of the Cleveland Diesel Engine Division of General Motors is responsible for a tremendous flow of Diesel engines that are powering submarines, mine sweepers, escort vessels and many other types of fighting craft.

Since receipt of the original order for defense material from the Navy in 1940, production at the Cleveland Diesel Engine Division has become one of the outstanding achievements on the American home front. Within one year from the date of the first order, production at Cleveland Diesel was stepped up to 12 times the normal output, and at the beginning of 1943 production had reached a figure 24 times the 1940 level. Mr. Codrington's company is a prime contractor to the Navy, supplying Diesel engines and many other mechanisms for more than a dozen types of war craft, and is a sub-contractor to many of the country's leading ship builders and other large manufacturers. Two large additions have been made

On duty all day — every day

with BUDA-LANOVA Diesels

In constant operation twenty-four hours a day, seven days a week, this 48-foot Passenger Ferry is in service in the Chesapeake and Delaware Canal out of Chesapeake City, Maryland. Her propulsion unit is a Buda-Lanova, Model 6-DMHR-909 Marine Diesel with 2:1 reduction gear. Buda design, materials, and workmanship are all geared to dependable performance under continuous marine duty.

The distinctive feature of the Buda-Lanova Diesel is the Lanova combustion system which, as used in Buda Marine Diesels, results in lower compression ratios, lower ultimate combustion pressures, lower rate of pressure rises, smoother operation; lower exhaust and piston temperatures and cleaner combustion—all of which assures higher over-all efficiency, longer engine life—MORE HORSE-POWER HOURS PER DOLLAR INVESTED.

LANOVA
THE HEART OF THE ENGINE

THE BUDA CO.
ESTABLISHED 1881
HARVEY CHICAGO SUBURB • ILLINOIS

to the original plant, and recently a new plant, with nearly 350,000 square feet of floor space, was erected by the Navy for operation by the Cleveland Diesel Engine Division.

Officers re-elected at the annual meeting of the National Association were A. E. Luders, Stamford, Conn., second vice president; J. Stern, Milwaukee, Wis., third vice president and E. E. Palmer, Cos Cob, Conn., treasurer. Ira Hand, Larchmont, N. Y., will continue to act as executive secretary.

NOW READY!

★ **BOUND VOLUMES OF THE 1942 ISSUES OF DIESEL PROGRESS ARE NOW AVAILABLE AT $10.00 EACH.**

Address DIESEL PROGRESS 2 West 45th Street, New York, for your copy.

Everything HINGES on lubrication...

We won't go into the "causes and effects" of lubricating oil failures. Engineers want to *know how* to prevent trouble and damage *before it happens.*

That's the VISCO-METER'S* job... and what a whale of a job it's doing on land and sea... watchdoggin' on the gasoline and Deisel engines that power many units of our transports, fighting machines and service equipment.

Uncle Sam enlisted the VISCO-METER* long before Pearl Harbor when, in several branches of government service, the VISCO-METER* had proved its worth. No wonder then that today every VISCO-METER* we make goes with some gasoline or Deisel engine consigned for war service.

With the Peace, VISCO-METER* will again be available to those internal combustion engine manufacturers... automotive, marine and stationary... who will acquaint themselves with its decided advantages. There's nothing so convincing as a service record and it's not too soon to talk to a VISCO-METER* engineer.

VISCO-METER
CORPORATION GROTE ST., BUFFALO, N. Y.

VISCO-METER: a 12-ounce precision instrument continuously indicating to the operator the viscosity (lubricating ability) of the crankcase oil while the engine is in operation.

**Fully covered by U. S. and Foreign Patents*

The Why and Wherefore of Scrap

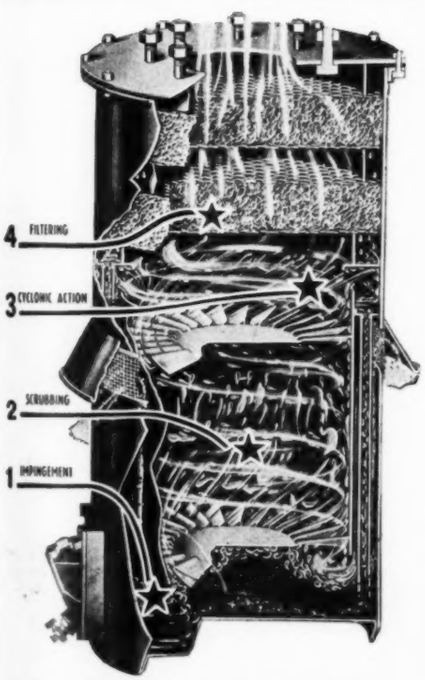
Editor's Note: Following are the second and third chapters of the Primer of Industrial Scrap, published by Business Press Industrial Scrap Committee. More on this vital subject will follow in the May issue of DIESEL PROGRESS.

NO industrialist has to be sold on the necessity of providing U. S. fighting forces with weapons to strike down the enemies of this country or to be told that our steel and his scrap plays the biggest single role in the war. He might have overlooked, however, what a great favor he can do for himself by a conscientious effort to salve his obsolescent machinery. He might have forgotten that it is within his power to help keep our industrial economy in working order by means of more and more scrap so that we can fight the battle of steel, not only abroad, but at home.

Consider the tremendous quantities of equipment not directly listed as war items which are required to keep the industrial economy going at its feverish pitch. The thousands of new freight cars we ought to have, the mechanized equipment and the other items our farmers should have, the steel barrels needed to transport materials between industrial plants, the steel mill rolls the steel mills should have, the houses and transportation equipment that labor needs in newly developed areas.

Then consider minor items which often play big parts: Without track appliances and car repair parts or signal lanterns, railroad operating efficiency is lowered. Your incoming materials may be delayed; your outgoing goods subjected to greater risk. Lacking a gear or a control part, the machine tool in your sub-contractor's plant must be idle. Unable to obtain an expansion joint, an oil refinery might be crippled with widespread repercussions. A ripple of dislocation can be started through industry while someone is waiting for a piece of steel for a test run, for a tool or die, a crane or conveyor part, a sawblade, a spring, an electrode or even nails or bolts.

To serve more people the cook can either reduce the size of individual portions or add to the size of the meal, if possible. Our cook—the Government—is not likely to add to the size of our industrial meal until our foreign commitments are amply provided for. Steel consumers can help increase the size of their portions by providing more scrap for steel making. Thus, they will help themselves indirectly.



Write for Cycoil Bulletin No. 130D which gives complete information on the operation of the Cycoil.

Cycoil CLEANERS WILL KEEP YOUR ENGINES AND COMPRESSORS RUNNING LONGER

Around-the-clock war production schedules are working power plants far beyond their normal capacities which makes it all the more necessary to protect precious engines and compressors from excessive wear and breakdowns due to dust.

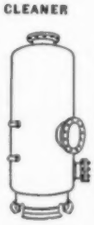
In dollar outlay, air cleaners are still a small factor in any engine setup, but their importance to the life of your engines or compressors makes it all the more necessary to choose the type of air cleaner that will render the very best possible service.

Write for Cycoil Bulletin No. 130D which gives complete information on its operation.

AMERICAN AIR FILTER CO., INC.
Incorporated
408 Central Avenue, Louisville, Ky.
In Canada: Darling Bros., Ltd., Montreal, P. Q.

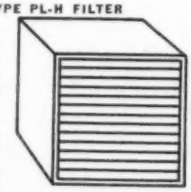
CYCOIL GAS CLEANER

Suitable for practically every gas cleaning problem when temperatures do not exceed 140°F. Operates on same principle as Cycoil Oil Bath Air Cleaner. Ask for Bulletin 130D.



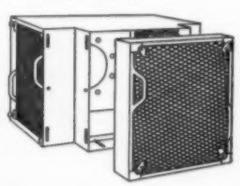
TYPE PL-H FILTER

Is a complete assembly consisting of housing, ready to bolt to intake pipe, and dry cell type filters in which wool felt constitutes the filter medium. Ask for Bulletin 120D.



TYPE OCH FILTER

Complete assembly consisting of Washable viscous impingement type filters. 1, 2, 3 or more cells are used, depending upon size of cleaning job. Ask for Bulletin 120D.



AMERICAN Cycoil AIR and GAS CLEANERS

The more scrap, the more steel. The more steel for fighting equipment, the more steel there will be for domestic war industry. In late 1942 almost one out of every five tons of steel produced was going into shipbuilding, both naval and commercial. This is only one project in our armament program.

With present construction supplies there is not likely to be much production of those small parts. Those nails, for want of which kingdoms have been lost. That's why an increased alertness to dormant industrial scrap is necessary if we are to meet both our war and domestic production schedule of 97,115,000 steel ingot tons for 1943.

Another reason why industrial scrap housecleanings are synonymous with good business is the deductions in taxes which are thoroughly discussed in the following article prepared by L. C. Reed, Inland Steel Company, Chicago, Illinois. Mr. Reed is Chicago Regional Chairman of the Industrial Salvage Campaign:

"It would evidently seem advantageous for industry to immediately move into salvage or scrap all unused or obsolescent equipment and materials which will, undoubtedly, not be used until after the war, and which will be of doubtful use in the post-war period because of new developments or changes in design at such time. Particularly if a fair net profit is being realized now, this may be the best time to write off everything of questionable future use rather than find it necessary to do this at a later post-war date, when industry may not be in such a good position to do so.

By disposing of all old out-moded or antiquated equipment at this time industry would be in a position to start the post-war period of commercial activity with up-to-the-minute equipment of latest improvements and design, and could impress the trade with the thought that there can then be produced with this new equipment a perfected product more true to dimensions and more accurately formed and thus of greater utility and application in use than ever before.

According to the press the United States Treasury Department in Washington announced as follows:

When through some change in business conditions the usefulness in the business of some or all of the capital assets, such as machine tools, is suddenly terminated, so that such assets are permanently discarded by a taxpayer from use in such business, the taxpayer may claim a deduction in his Federal income tax returns as a loss for the year in which such action is taken for the difference between the adjusted basis and the salvage value of the property.

In investigating the possibilities of this feature the following information might be used according to the particular situation involved:

1. When the material to be scrapped has not been fully depreciated on the books, full depreciation can be taken at this time, and this amount, less salvage value, may be deducted as a loss in the tax return. This would thus operate a diminution of top bracket taxes.

2. If the material to be scrapped is considered to be entirely depreciated on the books one of two results would obtain, depending upon the accounting methods used:

(a) If the item is depreciated down to salvage

CONTINUOUS, DEPENDABLE POWER

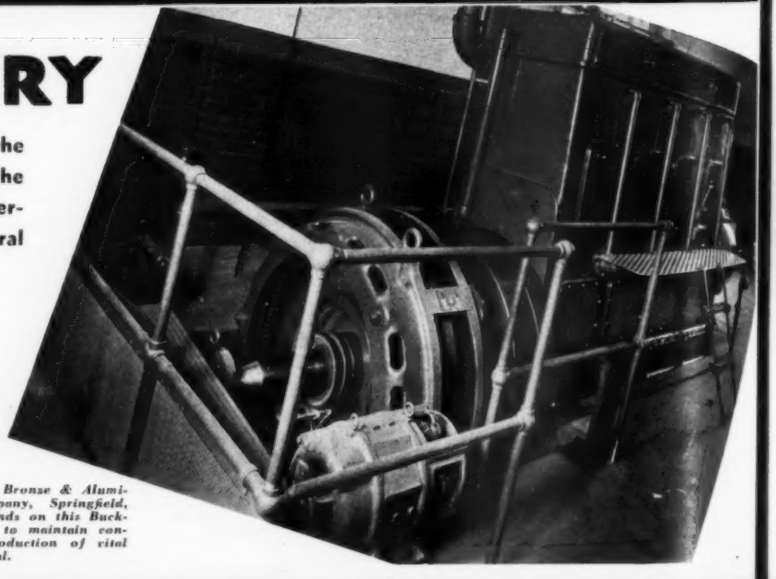
for WAR INDUSTRY

Yes, Buckeye Diesels are in the war and behind the war, turning out low-cost, dependable power for the urgent needs of our war effort. Buckeye Diesel performance, economy, and long life are the natural results of Buckeye's distinctive features—

★ Silent Watchman
★ Speed Watchman
★ Full Pressure Lubrication
★ Reversible Shell-Type Silver Alloy Bearings
★ Complete Engine Enclosure

Plus Buckeye Craftsmanship backed by 35 years' experience.

Engine Builders Since 1908



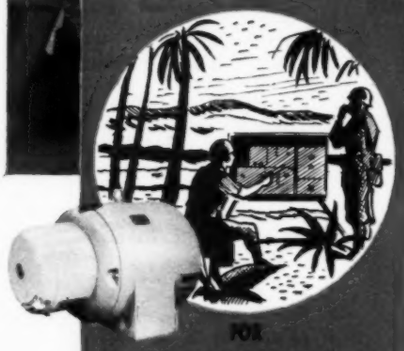
Springfield Bronze & Aluminum Company, Springfield, Mass. depends on this Buckeye Diesel to maintain continuous production of vital war material.

Be Profitwise and Dieselize with Buckeyes

THE BUCKEYE MACHINE COMPANY ..... LIMA, OHIO

Fighting Generators for Fighting Fronts

FOR AIR BASES



FOR COMMUNICATION CENTERS

FOR BASE HOSPITALS

ELECTRIC GENERATORS THAT MEET REQUIREMENTS OF U. S. ARMED FORCES FOR MOBILE EQUIPMENTS

STURDY without being heavy and hard-to-handle—easily assembled, with either a gasoline or a diesel engine—engineered to prevent radio interference. These G-E generators will help you, as a manufacturer of engine-driven sets, to meet the exacting standards for fighting equipments set by the U. S. Armed Forces.

On your next government order for mobile engine-generator sets, let G. E. supply you with electric generators correctly engineered to specifications. Your nearest G-E representative will be glad to furnish complete details. *General Electric, Schenectady, N. Y.*

GENERAL ELECTRIC

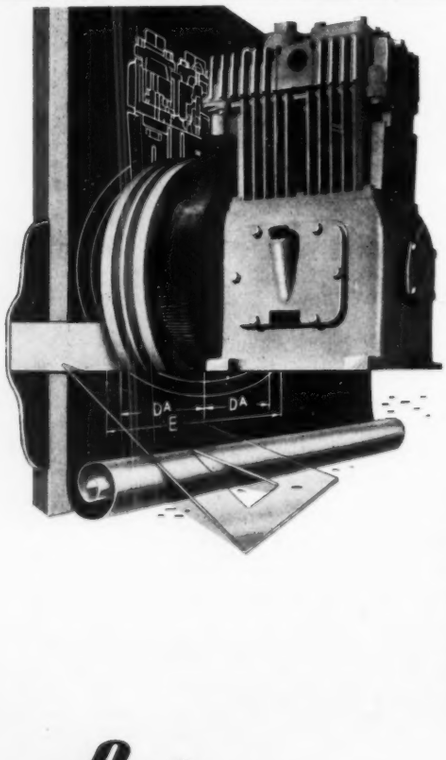
Below: Diesel type ECCENTRIC Valve Seat Grinder and Wet Type Diesel Valve Refacer.

In industrial, municipal, transportation, or fighter service, diesels are operating extra hours under extra loads . . . Valves and valve seats bear the brunt of all this . . . To keep valves performing with maximum efficiency longer, requires the finer precision and finish which the HALL ECCENTRIC Valve Seat Grinder and Wet Type Valve Refacer can give . . . Gets them back in service faster, too . . . Write us for complete information on the HALL Equipment pictured here and designed especially for servicing diesel valves and valve seats to factory standards of precision and finish.

The Hall Manufacturing Co., Toledo, Ohio, U.S.A.

FOR VICTORY BUY UNITED STATES SAVINGS BONDS STAMPS

HALL



Modern Design

☆ INSIDE AND OUT ☆

Modern, improved design—inside and out—results in greater over-all efficiency for Quincy Compressors. Cooling area is increased 12%. Construction is simplified. Lubrication is more thorough . . . more positive. The policy of building air compressors exclusively has helped to make the name "Quincy" a symbol for dependability. Quincy Compressors provide dependable air supply for Diesel starting and other services requiring intermittent pressures up to 500 lbs. per sq. inch. If you have compressed air problems in connection with war work, *let us help you solve them.*

Quincy COMPRESSORS

QUINCY COMPRESSOR CO., Dept. K-4, Quincy, Illinois

value, which is still carried on the books, the scrapping of the material merely eliminates this item from the books, showing neither profit nor loss to be reckoned with as far as taxes are concerned. There thus being no change either way in the tax status there would appear no reason for not helping the war effort, and the material should be willingly scrapped.

(b) If the material is fully depreciated on the books the amount as scrapped is thrown into the profit and loss account and becomes a small profit. This small profit would appear as an insignificant tax item and the larger advantage of moving these old materials now and helping the war effort should easily outweigh this small tax item.

Another thought of practical application which should be emphasized is the fact that in a good many companies there are accumulations of old equipment and materials which have been stored away for possible use sometime, but will probably not be used until after the war, even if then. It may be the present value of these materials is much less than the cost of the floor space they occupy, particularly if they have been so held for a long period of time. This is really an actual loss on the books, although it may not so readily appear. Under such a condition it would be advantageous to move this material into salvage or scrap, thus stopping this continuous loss and put this space to more profitable use."

Industrial Scrap

This most important of all scrap sources may be broken down into three divisions:

(a) Immediate steel mill scrap. This is scrap generated at the steel mill in the manufacture of steel. It includes ingot croppings, chips created in the conditioning of semi-finished steel and similar material known as "home scrap" because it never leaves the steel mill and is available for immediate charging back into the furnaces. In August, 1942, mills consumed 2.5 million tons of home scrap against 1.9 tons of purchased scrap.

(b) Short term industrial scrap. This is the waste or by-product of plants processing iron and steel into finished products. It includes pieces of material which remain after a stamping is made, turnings from the machining of a steel bar, or similar material.

(c) Dormant Industrial Scrap. This classification includes products or parts which have completed their service of life, such as obsolete machinery, tools, dies, fixtures which are in

capable of current or future use in war production because they are broken or lack parts which cannot be obtained, or for various other reasons. The WPB suggests the following rule in regard to dormant scrap: "If it hasn't been used for three months and no one can prove it can be used in the next three months, find a use for it or scrap it."

OPA Breakdown in Grades of Scrap

The following definitions of scrap types likely to be found in industrial plants will help not only in the identification of what is scrap, but if adhered to will increase plant income from the sale of scrap. By comparing following definitions with the OPA price schedule referred to in Chapter Four, an approximation of scrap values can be arrived at.

Basic Open Hearth Grades

No. 1 Heavy Melting Steel. Clean wrought iron or steel scrap ¼ inch and over in thickness, not over 18 inches in width and not over 5 feet in length. Individual pieces must be free from attachments and so cut as to lie flat in the charging box. No piece may weigh less than 5 pounds. May include heavy forgings, forge butts, billet, bloom, slab or bar crops not conforming to chemical analysis required for electric furnace or acid open hearth use. May include new mashed pipe ends, original diameter 4 inches and over. May not include auto body and fender stock.

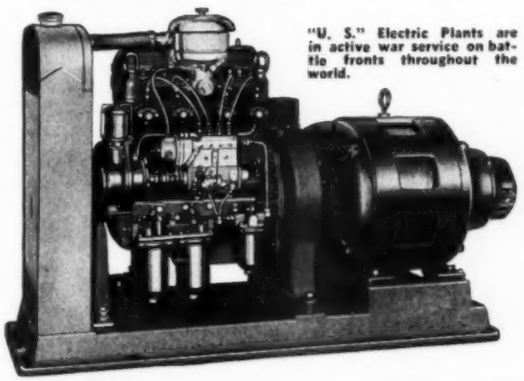
No. 2 Heavy Melting Steel

Wrought iron or steel scrap, black or galvanized, ⅛ inch or over in thickness, not over 18 inches in width and not over 5 feet in length. Includes uncut bumpers and front axles of autos. May include pipe, heavy cable, cut to lengths; car sides and light plate cut 15 inches by 15 inches and under. May not include auto body and fender stock.

No. 1 Busheling. Clean wrought iron and steel scrap 1/16 inch and heavier in thickness, not exceeding 12 inches in any dimension. May not contain burnt material, cast or malleable scrap or auto body and fender material. Must be free of coated, painted, limed, or enameled stock.

No. 1 Bundles. New black steel sheet scrap, hydraulically compressed to charging box size and weighing not less than 75 pounds per cubic foot. May contain new black sheet clippings and skeleton scrap. Must be free of paint or protective coating of any kind. May not include detinned scrap, electrical sheets, or any material over 0.5% of silicon.

No. 2 Bundles. Body and fender scrap or similar black sheet scrap, hydraulically compressed to charging box size and weighing not less than



"U. S." Electric Plants are in active war service on battle fronts throughout the world.

A diversified background of experience in building electric plants for all types of applications enabled the U. S. Motors Corporation to step right into war production and meet the diversified requirements of our various branches of service.

U. S. MOTORS CORP.
Oshkosh, Wis.

U.S. DIESEL
ELECTRIC PLANTS

ALL OUT for VICTORY
Put Your Scrap Into the Fight!

MECHANIZED WAR
Demands the BEST
in Diesel Performance

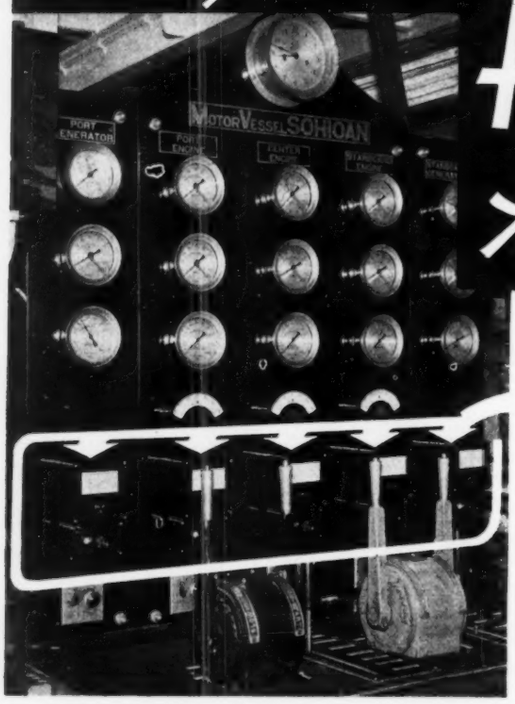
Roots-Connersville Blowers are helping step up horse-power output from given engine displacement in many supercharging and scavenging applications. Direct drive from engine automatically varies delivered air to suit engine requirements and builds up just the pressure needed for most efficient operation.

Photo shows "R-C" Scavenging Blower of 11,000 CFM capacity; 3 lbs. pressure; 850 RPM; such as used on Diesel motorships.
Roots-Connersville builds blowers to meet your specific engine requirements of speed, pressure, CFM, mounting, drive, inlet and outlet arrangement, etc. We will be glad to work with you on supercharging and scavenging problems.

ROOTS-CONNERSVILLE BLOWER CORP.
304 MIDLAND AVENUE CONNERSVILLE, INDIANA

Roots CONNERSVILLE SINCE 1854
Supercharging and Scavenging BLOWERS

Complete ALNOR Protection



Five "Alnor" Multipoint Pyrometers protect the Diesels on the ultra-modern towboat "Sohioan"

The most powerful Diesel towboat on the River, the "Sohioan," was built by St. Louis Shipbuilding and Steel Company for The Standard Oil Company of Ohio. She is powered with three main Diesels totalling 2415 hp. and two 90 hp. auxiliary Diesels, all Fairbanks, Morse. Five "Alnor" Multipoint Pyrometers are installed on the engine-room control station giving the engineer fingertip indication of individual cylinder performance at all times. Modern Diesel vessels require and have the best in protective equipment.

●

Specify and Buy "Alnor."

Illinois Testing Laboratories Inc.

Don't Guess Know!

147 WEST HUBBARD STREET CHICAGO, ILLINOIS

Manufacturers "Alnor" and "Price" Pyrometers The Products of 43 years' experience

75 pounds per cubic foot. May include chemically detinned material. No tin can will be deemed to be detinned unless it has undergone the chemical process for the removal and recovery of tin. May not include galvanized, vitreous enameled stock, tin plate, terne plate or other metal coated material. Painted or lacquered material shall not be considered as coated material. May include hydraulically compressed uncoated fence wire and light coil springs.

No. 3 Bundles. Galvanized sheet scrap or galvanized wire hydraulically compressed into charging box size and weighing not less than 75 pounds per cubic foot. May not include terne plate or vitreous enameled stock.

Tin-can Bundles. Must be exclusively tin coated or tin-alloyed material, reasonably clean with all contents removed, and hydraulically compressed into charging box size. Minimum weight 75 pounds per cubic foot.

Machine Shop Turnings. New, clean steel turnings, including high sulphur shell turnings, free of lumps, tangled or matted material, cast iron borings, non-ferrous metals, or excessive oil. May not contain badly rusted or corroded stock. This grade may include high sulphur turnings or shell turnings.

Blast Furnace Grades

Mixed Borings and Turnings. Clean, short steel and wrought iron turnings, drillings, screw cuttings and cast or malleable iron borings and drillings, free of stringy, bushy, tangled lumps, scale, and excessive oil.

Shovelling Turnings. Clean, short, steel and wrought iron turnings, drillings, or screw cuttings free of stringy, bushy or tangled material, lumps, excessive oil or scale.

Cast Iron Borings. Clean cast iron borings and drillings, free of steel turnings, scale, lumps and excessive oil.

No. 2 Busheling. Cut hoops, netting, cut up baled fence wire, light sheets, rusted car sides, cotton ties, and galvanized light material. No dimension over 12 inches. May be black or galvanized. No hard steel, cast, malleable, or enameled or metal coated material may be included.

Electric Furnace, Acid Open Hearth and Foundry Grades

Billet, Bloom and Forge Crops. Billet, bloom, axle, slab, heavy plate and heavy forge crops not over 0.05% phosphorus or sulphur, nor over 0.5% silicon and free from alloys. May be not less than 2 inches in thickness, not over 18 inches in width, and not over 36 inches in length. No piece to weigh less than 10 pounds nor more than 500 pounds. Must be new material.

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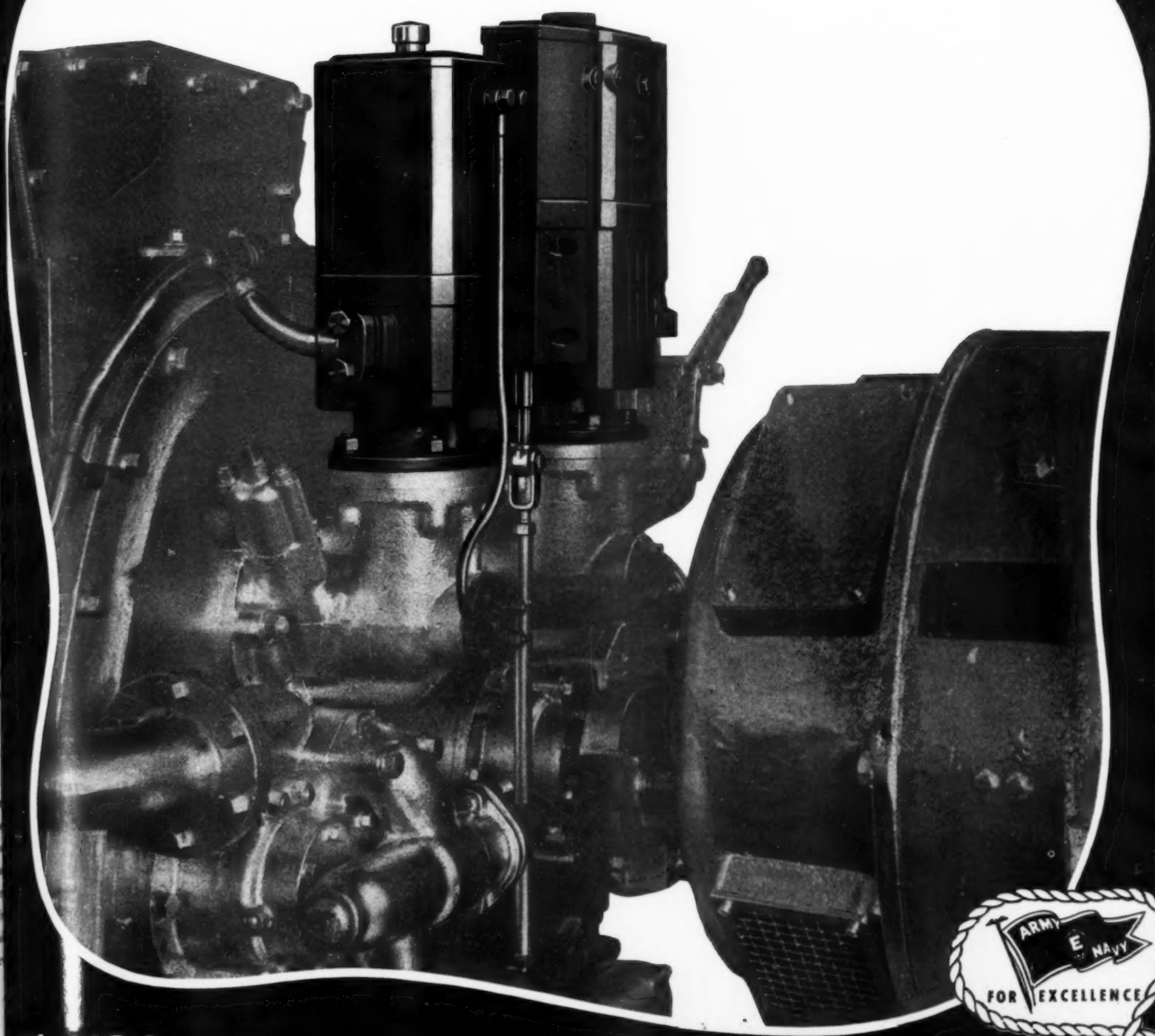

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Bar Crops and Plate Scrap. Bits, jars, tool joints, shell forgings, flashings, bar crops, and plate scrap, not over 0.05% of phosphorus or sulphur, not over 0.5% of silicon, and free from alloys. Must be not less than 2 inches in thickness, not over 18 inches in width, and not over 36 inches in length, except that plate scrap may not be less than ½ inch in thickness. Flashings may be of any thickness but may not exceed 2 feet in length.

Punchings and Plate Scrap. Punchings and plate scrap, not over 0.05% of phosphorus or sulphur, not over 0.05% of silicon and free of alloys. May include bar crops. All material must be cut 12 inches and under. Punchings may not be less than ¼ inch in diameter.

Cast Steel. All cast steel not over 48 inches long or 18 inches wide, not over 0.05% phosphorus or sulphur, free of alloys and attachments. May include heads, gates, and risers.

Tube Scrap. Tube scrap, seamless or welded, not over 0.05% phosphorus and sulphur, free of alloys. Not more than 18 inches in length, and not over 6 inches inside diameter. May be mashed or unmashed. Pieces over 6 inches inside diameter may be included when thoroughly flattened. Must be new material.

Cut Structural and Plate Scrap, 3 Feet and Under. Clean, open hearth steel plates, structural shapes, crop ends, shearings, or broken steel tires. Must be not less than ¼ inch thick, cut to 3 feet and under. Not over 0.05% of phosphorus or sulphur.

Cut Structural and Plate Scrap, 1 Foot and Under. Clean open hearth steel plates, structural shapes, crop ends, shearings, or broken steel tires. Must be not less than ¼ inch thick, cut to 1 foot and under. Not over 0.05% of phosphorus or sulphur.

Cut Structural and Plate Scrap, 1 Foot and Under. Clean open hearth steel plates, structural shapes, crop ends, shearings, or broken steel tires. Must be not less than ¼ inch thick, cut to 2 feet and under. Not over 0.05% of phosphorus or sulphur.

Cut Automotive Steel, 3 Feet and Under. Steel parts of automobiles free from attachments and non-ferrous metals. Cut 3 feet and under. May include frames, driving rods, rear-ends, front axles, and rims. No body and fender stock may be included.

Cut Automotive Steel, 2 Feet and Under. Steel parts of automobiles free from attachments and non-ferrous metals. Cut 2 feet and under. May include frames, driving rods, rear-ends, front axles, and rims. No body and fender stock may be included.

Cut Automotive Steel, 1 Foot and Under. Steel parts of automobiles free from attachments and non-ferrous metals. Cut 1 foot and under. May

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Heavy Turnings. Short, heavy steel turnings not over 0.05% phosphorus or sulphur. Must be free from alloys. Must weigh not less than 75 pounds per cubic foot. This grade may include rail chips.

Electric Furnace Bundles. New, black steel sheet scrap hydraulically compressed into bundles 14 x 14 x 20 or smaller.

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Briquetted Machine Shop Turnings. Machine shop turnings, Item 8, compressed into a cohesive non-friable solid reasonably free from oil, each briquette to weigh not more than 20 pounds and to have a density of not less than 60%.

Baled Machine Shop Turnings. Machine shop turnings, Item 8, hydraulically compressed into bundles weighing not less than 75 pounds per cubic foot. May not include any binding or wrapping material.

Briquetted Shovelling Turnings. Shovelling turnings, Item 10, compressed into a cohesive non-friable solid reasonably free from oil, each briquette to weigh not more than 20 pounds and to have a density of not less than 60%.

Briquetted Cast Iron Borings. Cast iron borings, Item 12, compressed into a cohesive non-friable solid reasonably free from oil, each briquette to weigh not more than 20 pounds and to have a density of not less than 60%.

No. 1 Chemical Cast Iron Borings. New clean cast iron borings and drillings containing not more than 1.00% oil, free from steel turnings or chips, lumps, scale, corroded or rusty material.

No. 2 Chemical Cast Iron Borings. New clean cast iron borings and drillings containing not over 1.50% oil, free from steel turnings or chips, lumps, scale, corroded or rusty material.

Cast Iron Scrap

No. 1 Cupola Cast. Clean cast-iron scrap, such as columns, pipes, plates and castings of miscellaneous nature, but free from stove plate and agricultural scrap. Must be cupola size, not over 24 by 30 inches in dimensions, and no piece to weigh over 150 pounds. Must be free from steel and malleable parts and foreign material.

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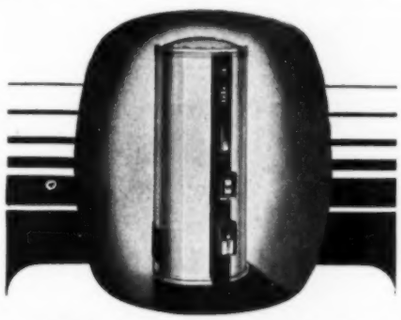

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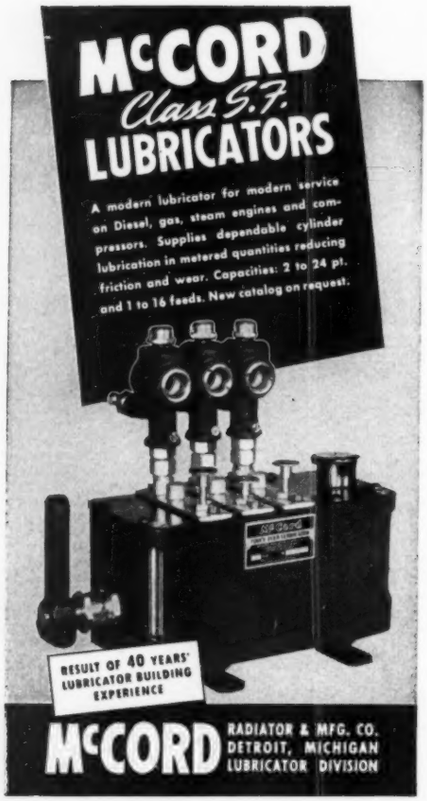
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No. 1 Machinery Cast, Drop Broken, 150 lbs. and under. Clean machinery cast-iron scrap. May include the cast-iron parts of agricultural machinery. Must be cupola size, not over 24 by 30 inches in dimensions, and no piece to weigh over 150 pounds. Must be free from steel and malleable parts.

Clean Auto Cast. Clean, broken auto blocks, free of all steel parts and broken 75 pounds or under.

Unstripped Motor Blocks. Motor blocks from which steel or non-ferrous fittings have not yet been removed.

Stove Plate. Clean cast-iron stove plate. Must be free from malleable and steel parts, window weights, plow points, grates, burnt iron, etc.

Heavy Breakable Cast. Clean cast-iron scrap, such as columns, pipes, plates and castings of miscellaneous nature, weighing over 150 pounds, and which can be broken by an ordinary drop into cupola size.

Changing Box Size Cast. Clean, cast-iron scrap, such as columns, pipes, plates and castings of miscellaneous nature, but free from stove plate and agricultural scrap. Must be 18 in. x 5 ft. and smaller.

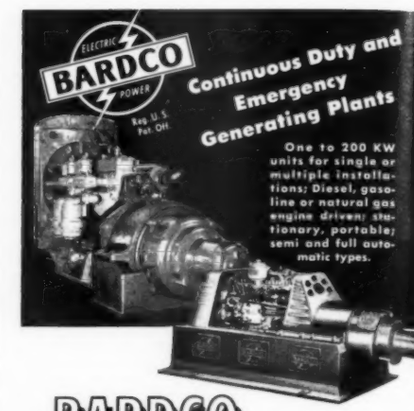
Miscellaneous Malleable. Malleable parts of automotive vehicles, agricultural implements, and miscellaneous malleable iron castings. Must be free from cast iron and steel parts and other foreign material.

NOTE—Definitions of grades are from the OPA Price Schedule on Iron and Steel Scrap, which sets ceiling prices for steel mills and foundries. The definitions will serve for guidance.

New Bulletin On Collodial Graphite

ACHESON Colloids Corporation has just published a new 12-page illustrated bulletin, No. 430-AA, on the importance of "dag" colloidal graphite to modern industry.

This bulletin describes the physical and chemical properties of "dag" colloidal graphite and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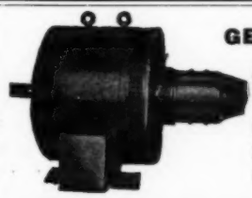

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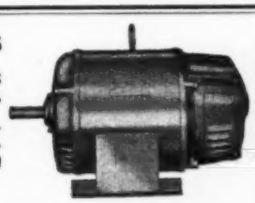

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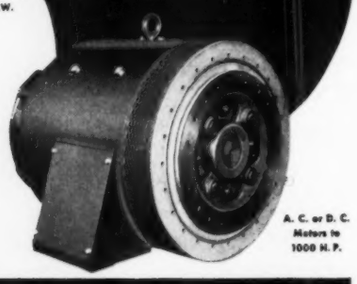

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